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UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

Nos. 02-1005, 02-1082
June 2, 2004

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs-Appellants,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant-Cross Appellant.

Robert G. Krupka, Kirkland & Ellis, of Los Angeles, CA, for plaintiffs-appellants. With him on the brief were Jonathan F. Putnam, Todd S. Schulman, Lee Ann Stevenson and Vickie Reznik, of New York, NY. Of counsel on the brief was John Donofrio, General Counsel, Honeywell Aerospace, of Phoenix, AZ. Of counsel were Christian Douglas Wright and Josy W. Ingersoll, Young Conaway Stargatt & Taylor, LLP, of Wilmington, DE.

Richard F. Ziegler, Cleary, Gottlieb, Steen & Hamilton, of New York, NY, for defendant-cross appellant. With him on the brief were Lawrence B. Friedman, Joshua H. Rawson, David H. Herrington, Justin S. Anand and Christopher P. Moore.

Before MAYER, Chief Judge, NEWMAN, MICHEL, LOURIE, CLEVENGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges.

Opinion for the court filed by Circuit Judge DYK, in which Chief Judge MAYER and Circuit Judges MICHEL, LOURIE, CLEVENGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, and PROST join. Opinion dissenting in part filed by Circuit Judge NEWMAN.

DYK, Circuit Judge.

Honeywell International Inc. and Honeywell Intellectual Properties, Inc. (collectively "Honeywell"), the assignees of the patents in suit, brought suit against Hamilton Sundstrand Corporation ("Sundstrand") for infringement of claims 8, 10, 11, 19 and 23 of United States Patent No. 4,380,893 (the "'893 patent") and claim 4 of Patent No. 4,428,194 (the "'194 patent"). All of the asserted independent claims were originally dependent claims that were rewritten into their present independent form during prosecution. The broader original independent claims were cancelled.

The jury found that the patents in suit were valid and, although not literally infringed, infringed under the doctrine of equivalents. The district court entered judgment against Sundstrand. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 166 F.Supp.2d 1008 (D.Del. 2001).

Following our recent decisions in *Deering Precision Instruments, L.L.C. v. Vector Distribution Systems, Inc.*, 347 F.3d 1314 (Fed.Cir.2003), and *Ranbaxy Pharmaceuticals, Inc. v. Apotex, Inc.*, 350 F.3d 1235 (Fed.Cir.2003), we hold that the rewriting of dependent claims into independent form coupled with the cancellation of the original independent claims creates a presumption of prosecution history estoppel. Accordingly we vacate the judgment of infringement and remand for determination of whether Honeywell can rebut the presumption of surrender under *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002), *remanded to* 344 F.3d 1359 (Fed.Cir.2003) (*en banc*). We affirm the district court's judgment rejecting Sundstrand's counterclaims of invalidity.

BACKGROUND I

The Honeywell patents are directed to an aircraft auxiliary power unit ("APU"), a small gas turbine engine usually located in the tail section of an airplane. The APU generates electricity and incorporates a load compressor to provide compressed air needed both to start the aircraft's main engines and to control the environment of the aircraft's cabin during flight. During flight, the amount of compressed air required for these purposes fluctuates substantially. A valve is used to control the amount of air exiting the compressor through the main air duct, which supplies compressed air to the aircraft's systems. Rapid changes in the demand for compressed air needed can produce "surge," a flow instability that occurs

when pressure builds up in the main air duct. In a surge condition, the air attempting to exit the compressor's main air duct is unable to do so. Instead the airflow reverses direction, surging back into the compressor and potentially damaging the APU. The APU must therefore be designed in such a way as to control surge. Prior systems controlled surge by drawing in more air than was needed and venting (bleeding) the excess through a surge bleed valve in order to reduce pressure in the main air duct. Such systems maintained sufficient output airflow, effectively controlling surge, but were inefficient in operation and wasteful of energy.

The Honeywell APU is designed to be more efficient by avoiding excess air bleeding in its control of surge. To do this it is necessary to determine when and how far to open the surge bleed valve in order to maintain a level of flow sufficient to avoid surge. To reach this end, Honeywell's invention establishes a "set point" that represents the minimum flow at which surge can safely be avoided. In the claimed invention, "[a]mbient air...is drawn through a set of adjustable inlet guide vanes." '893 patent, col. 3, ll.64-65. The value of the set point is selected "as a function of the position of said inlet guide vanes." *Id.*, col. 12, ll.11-12; *see also* '194 patent, col. 12, ll.15-16. The set point is compared to a "flow-related parameter" that represents airflow out of the compressor as determined by a sensor. '893 patent, col. 2, ll.47-48; '194 patent, col. 2, ll.-48-49. Thus a comparison is made between the actual flow conditions (represented by the flow-related parameter) and the desired flow conditions (represented by the set point). If the system

determines that airflow out of the main air duct is too low, the surge bleed valve will be opened to prevent the build up of excess pressure leading to surge.

II

The '893 and '194 patents resulted from a common application filed February 19, 1981. The specification of both patents is identical. Only claims 8, 10, 11, 19 and 23 of the '893 patent and claim 4 of the '194 patent are at issue in this case. Each of these claims requires the APU to include inlet guide vanes and requires the operation of the surge bleed valve to be a function of inlet guide vane position. Claim 8 is representative of the apparatus claimed in the '893 patent:

> 8. A gas turbine engine accessory power unit having a fluctuating compressed air supply demand, said accessory power unit comprising:
> (a) a compressor *having adjustable inlet guide vanes*;
> (b) duct means for receiving compressed air discharged from said compressor and supplying the received air to the pneumatically-powered apparatus;
> (c) surge bleed means operable to exhaust from said duct means a selectively variable quantity of air to assure at least a predetermined minimum flow rate through said duct means and thereby prevent surge of said compressor;
> (d) sensing means for sensing the value of a predetermined, flow-related parameter within said duct means and generating an output signal indicative of said value, said value of said flow-

related parameter being substantially independent of the temperature of the compressed air;

(e) comparator means for receiving said sensing means output signal and generating an error signal representing the difference between the sensed value of said parameter and a desired value thereof, said comparator means having an adjustable control set point representing said desired value of said parameter;

(f) means for transmitting to said comparator means a reset signal for *varying said set point as a function of the position of said inlet guide vanes* in accordance with a predetermined reset schedule; and

(g) control means for receiving said error signal and transmitting to said surge bleed means a control signal to operate said surge bleed means, the magnitude of said control signal having, relative to the magnitude of said error signal, a proportional component and an integral component, whereby said minimum flow rate though said duct means is essentially constant regardless of the compressed air supply demand of the pneumatically-powered apparatus.

'893 patent, col. 11, 1.52--col. 12, 1.23 (emphases added). Claim 4 of the '194 patent claims a method of controlling surge in an APU:

4. A method of utilizing a compressor of a gas turbine engine to power pneumatically-operated apparatus having a variable inlet air flow demand, the compressor *having adjustable inlet guide vanes*, said method comprising the steps of:

(a) interconnecting a supply duct between the compressor and the pneumatically-operated apparatus;

(b) flowing discharge air from the compressor through said supply duct to the pneumatically-*operated apparatus;*

(c) maintaining an essentially constant minimum supply duct flow rate, despite fluctuations in the flow rate of air received by the pneumatically-operated apparatus, by exhausting air from said supply duct in response to variations therein of the value of a predetermined, flow-related parameter, the flow rate of air exhausted from said supply duct being related to the magnitude of said parameter value variations in both a proportional and time-integral manner, said maintaining step including the steps of providing an outlet passage from said supply duct, positioning in said outlet passage a surge bleed valve operable to selectively vary the flow of air outwardly though said outlet passage, generating a proportional control signal in response to said variations in said flow-related parameter, and simultaneously utilizing said integral and proportional control signals to operate said surge bleed valve;

(d) *adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes.*

'194 patent, col. 10, l.64--col. 12, l.16 (emphases added).

III

Sundstrand manufacturers an APU device, the APS 3200, which also uses an active surge control system that compares a flow-related

parameter to a set point and adjusts the surge bleed valve in response. Sundstrand's device establishes a set point that is dependent upon ambient air temperature, rather than a measurement of inlet guide vane position. This set point is compared to a flow-related parameter called DELPQP. Because of characteristics unique to DELPQP,[1] the APS 3200 blocks control signals used to operate the surge bleed valve during extreme high flow conditions. This prevents unnecessary bleeding of air during such conditions. The determination of whether to block these control signals is based in part on the position of the APS 3200's inlet guide vanes.

Only infringement under the doctrine of equivalents is at issue in this appeal. Honeywell concedes that the inlet guide vane limitation[2] is not

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1 The DELPQP value used in the accused device has an unusual characteristic. In most airflow conditions the value of DELPQP is directly proportional to the amount of airflow. At high levels of flow, however, DELPQP becomes inversely proportional to the amount of flow, *i.e.*, above a certain level of flow DELPQP decreases instead of increases as flow increases. Reliance upon DELPQP under these conditions might incorrectly characterize a safe high flow situation as an unsafe low flow situation, resulting in the surge bleed valve being opened to increase flow unnecessarily, causing excess APU fuel consumption.

2 "Inlet guide vane limitation" here refers to both the claimed structure of the inlet guide vanes and their claimed function in the surge control system (*e.g.*, "varying said set point as a function of the position of said inlet guide vanes," '893 patent, claim 8, and "adjusting the relationship between the magnitudes of said . . . control signals and . . .

(Continued...)

literally met by the accused device. However, there is substantial disagreement as to the function of the inlet guide vanes required by the claims and whether inlet guide vane position performs an equivalent function in the accused device. Sundstrand contends that the claimed function is to use inlet guide vane position to establish the set point. It urges that the APS 3200 uses inlet guide vane position for a very different function, *i.e.*, to determine when to block control signals used to operate the surge bleed valve. Honeywell disagrees, arguing that the function of the inlet guide vane limitation "is to incorporate the position of the [inlet guide vanes] into the surge control system." (Reply Br. For Pls.-Appellants at 23 (claim 4); *see also id.* at 25 (claim 8).) It argues that this function is met because the APS 3200 uses inlet guide vane position, in addition to temperature, to efficiently control surge. Unfortunately, by agreement of the parties, the district court did not construe the claim language defining the function of inlet guide vane position in the '893 patent, and the court's construction of step (d) of claim 4 of the '194 patent and its jury instruction were somewhat cryptic.[3]

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said parameter variations as a function of the position of the inlet guide vanes," '194 patent, claim 4).

[3] The district court construed step (d) to mean "the relationship between the magnitudes of the control signals and the magnitudes of the parameter variations, and that relationship is adjusted as a function of the position of the inlet guide vanes." *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. 99-309 GMS, slip op. at 2, 2001 WL 34030812 (D.Del. Feb. 16, 2001).

IV

Honeywell filed this suit on May 17, 1999, alleging that the APS 3200 infringed both the '893 and '194 patents. Sundstrand denied that its device infringed the patents.

Sundstrand further pointed out that all of the asserted claims were originally dependent on other claims in Honeywell's patent applications (application claims 16 and 32 of the '893 patent and application claims 48 and 4 of the '194 patent) that did not contain the inlet guide vane limitation. These claims were rejected as obvious in light of the prior art during the prosecution of Honeywell's patents. Application claims 17 and 35 of the '893 patent and application claim 51 of the '194 patent, which further included the inlet guide vane limitation,[4] were not allowed only because they were

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4 Claims 17 and 35 of the '893 patent application and claim 51 of the '194 patent application provided:

> 17. The accessory power unit of Claim 16 wherein said compressor has adjustable inlet guide vanes, the value of said flow-related parameter is substantially independent of the temperature of the compressed air, said comparator means have an adjustable control set point representing said desired value of said parameter, and said accessory power unit further comprises means for transmitting to said comparator a reset signal for varying said set point as a function of the position of said

(Continued...)

dependent on the rejected independent application claims.[5] The examiner indicated that application claims 17, 35 and 51 would be allowable if rewritten into independent form. In response, the rejected independent claims were cancelled and application claims 17, 35 and 51 were amended to expressly incorporate the limitations of the rejected independent claims. The amended application claims issued respectively as claims 8 and 19 of the '893 patent and claim 4 of the '194 patent, which are the only independent claims found to be infringed by

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inlet guide vanes in accordance with a predetermined reset schedule.

35. The control system of Claim 32 wherein the compressor has adjustable inlet guide vanes, and said control system further comprises a guide vane position sensor and a function generator coupled in series between the inlet guide vanes and said input portion of said comparator.

51. The method of Claim 49 wherein the compressor has adjustable inlet guide vanes, and said method further comprises the step of adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes. (App. at 18640, 18645, 1873.)

5 Claim 35 was also rejected as indefinite under 35 U.S.C. § 112. This rejection was overcome by amendment to other claim limitations. Sundstrand does not argue that these other limitations are a basis for overruling the district court's judgment.

the jury and at issue in this dispute. Claims 10, 11 and 23 of the '893 patent, also found to be infringed, are dependent on claims 8 and 19 and thus include the inlet guide vane limitation.

Before the district court, Sundstrand urged that claims 8 and 19 of the '893 patent and claim 4 of the '194 patent were narrowed by amendment and that prosecution history estoppel barred all equivalents for the inlet guide vane limitation under *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558 (Fed. Cir. 2000) (*en banc*). In the alternative, Sundstrand argued that there was no infringement under the doctrine of equivalents because the APS 3200 used inlet guide vane position for a "completely different function" (*i.e.*, to determine when to block the control signal operating the surge bleed valve, as opposed to using inlet guide vane position to determine when and how much to open that valve). Affirmative defenses and counterclaims urging that the '893 and '194 patents were invalid as anticipated, obvious in view of the prior art, and barred by the on-sale bar of 35 U.S.C. § 102(b) were also asserted. Finally, Sundstrand argued that damages, if any, were limited to those incurred after February 3, 1999, the date it received actual notice of Honeywell's infringement allegations, because the patentee had failed to mark its products in accordance with 35 U.S.C. § 287. Sundstrand moved for summary judgment on each of these arguments.

On January 8, 2001 the district court, while acknowledging that Sundstrand's argument had "superficial appeal," rejected its motion for summary

judgment on prosecution history estoppel. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. 99-309 GMS, slip op. at 10, 2001 WL 66348 (D.Del. Jan. 8, 2001). The court held that because the claims were merely rewritten into independent form, the "elements at issue were not amended" and "Honeywell did not give up an embodiment of the invention with the inlet guide vane" limitation. *Id.* at 10-11. Sundstrand's other summary judgment motions for invalidity and infringement were denied because genuine issues of material fact remained. However, the district court granted Sundstrand's summary judgment motion on the marking issue and limited damages to those incurred after February 3, 1999. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. 99-309 GMS, 2001 WL 66345 (D.Del. Jan. 4, 2001). Subsequently, the district court clarified its decision to limit damages, holding that Honeywell could not recover damages on sales pursuant to contracts made prior to February 3, 1999, even if delivery occurred after that date. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. 99-309 GMS (D.Del. Feb. 8, 2001).

In February 2001 the case was tried before a jury. The jury found that all of the asserted claims of the '893 and '194 patents were not invalid. It rejected Honeywell's contention that Sundstrand had literally infringed the '194 patent, but found claims 8, 10, 11, 19 and 23 of the '893 patent and claim 4 of the '194 patent infringed under the doctrine of equivalents. The jury further found willfulness, and awarded $1,578,065 in reasonable royalty compensation and $45,000,000 in price erosion damages. Judgment in accordance with the jury

verdict was entered on February 20, 2001. On September 27, 2001, the court denied Sundstrand's motions for judgment as a matter of law ("JMOL") and a new trial. The court also denied Honeywell's motion for JMOL on literal infringement and its motion for enhanced damages, attorneys' fees and costs, including expert witness costs.

Honeywell timely appealed the district court's decisions limiting its actual damages. Honeywell did not appeal the judgment of no literal infringement. Sundstrand cross-appealed, challenging the district court's determinations of infringement under the doctrine of equivalents and the decision rejecting its claims of invalidity. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).[6] This case was originally heard by a panel of this court on August 7, 2002. The court sua sponte ordered *en banc* review on February 5, 2004.

DISCUSSION

We review the district court's denial of a motion for JMOL without deference, applying the

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[6] Although the district court's judgment did not expressly dispose of Sundstrand's counter-claims, the special verdict referred to in the court's final judgment specifically rejects each of Sundstrand's invalidity arguments. Since the district court's intent was clear, we interpret the judgment to be a final rejection of the counterclaims for invalidity. *See Pandrol USA, LP v. Airboss Ry. Prods., Inc.*, 320 F.3d 1354, 1362-63 (Fed. Cir. 2003); *Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d 1362, 1378 (Fed. Cir. 1999).

same standard employed by the district court. *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369 1373 (Fed. Cir. 2003). That standard requires us to "determine whether viewing the evidence in the light most favorable to the non-moving party, and giving the non-movant the benefit of all reasonable inferences, there is sufficient evidence of record to support a jury verdict in favor of the non-movant." *Id.* (internal quotation marks omitted). "We review the denial of a motion for a new trial for an abuse of discretion." *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1318 (Fed. Cir. 2003). Whether a patentee is presumptively estopped from asserting equivalents for a amended claim element is a question of law that we review without deference. *Ranbaxy*, 350 F.3d at 1240.

I. Prosecution History Estoppel

A

At the outset, this case requires us to determine first whether a narrowing amendment to a patent claim that adds an additional claim limitation creates a presumptive surrender of equivalents under the Supreme Courts decisions in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 117 S. Ct. 1040, 137 L.Ed.2d 146 (1997), and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 122 S. Ct. 1831, 152 L.Ed.2d 944 (2002) ("*Festo*"), and under our recent decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359 (Fed. Cir. 2003) (*en banc*) ("*Festo II*"), following the Supreme Court s remand. We hold that it does.

"The doctrine of equivalents allows the patentee to claim those insubstantial alterations that were not captured in drafting the original patent claim but which could be created through trivial changes." *Festo*, 535 U.S. at 733, 122 S. Ct. 1831. An element in the accused device is equivalent to a claim limitation if the only differences between the two are insubstantial. *Eagle Compromises, Inc. v. Arrow Communication Labs., Inc.*, 305 F.3d 1303, 1315 (Fed. Cir. 2002) (citing *Warner-Jenkinson*, 520 U.S. at 40, 117 S. Ct. 1040). However, prosecution history estoppel may bar the patentee from asserting equivalents if the scope of the claims has been narrowed by amendment during prosecution. *Festo*, 535 U.S. at 733-34, 122 S. Ct. 1831. "Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patents scope." *Id.* at 736, 122 S. Ct. 1831. The basic theory is that:

> [w]hen . . . the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised unforeseen subject matter that should be deemed equivalent to the literal claims of the issued patent . . . [H]is decision to . . . submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim.

Id. at 733-34, 122 S. Ct. 1831. However, as we recently explained *en banc* following the Supreme Courts remand in *Festo*, the presumption of

surrender may be rebutted if the patentee can demonstrate that: (1) "the alleged equivalent would have been unforeseeable at the time . . . the narrowing amendment" was made; (2) "the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent" at issue; or (3) "there was 'some other reason' suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent." *Festo II*, 344 F.3d at 1368 (quoting *Festo*, 535 U.S. at 741, 122 S. Ct. 1831).

The Supreme Court addressed the effect of a narrowing amendment on the scope of equivalents in *Warner-Jenkinson* and *Festo*. These decisions make clear that a narrowing amendment may occur when either (1) a preexisting claim limitation is narrowed by amendment or (2) a new claim limitation is added by amendment. These decisions make no distinction between the narrowing of a preexisting limitation and the addition of a new limitation. Either amendment will give rise to a presumptive estoppel if made for a reason related to patentability.

That the addition of a claim limitation constitutes a narrowing amendment is manifest in the language of both *Warner-Jenkinson* and *Festo*. In both of these decisions the Supreme Court indicated that amending to "introduce a new element," *Warner-Jenkinson*, 520 U.S. at 33,117 S. Ct. 1040, or "add[] a new limitation," *Festo*, 535 U.S. at 728, 122 S. Ct. 1831, may give rise to a presumption of surrender. This language is not dictum. Both *Warner-Jenkinson* and *Festo* directly held that amendments that added new limitations

could give rise to an estoppel. For example, in *Warner-Jenkinson*, the patentee claimed an "ultra filtration" process for purifying dye. 520 U.S. at 22, 117 S. Ct. 1040. Originally the claims at issue required "ultra filtration through a membrane having nominal pore diameter of 5-15 Angstroms under a hydrostatic pressure of approximately 200 to 400 p.s.i.g. . . . to thereby cause separation of said impurities from said dye." *Id.* During prosecution, the inventors added a new limitation, which narrowed the scope of the claimed invention from processes conducted at any pH to those occurring "at a pH from approximately 6.0 to 9.0." *Id.* The Supreme Court expressly treated this amendment as "introduce[ing] a new element" to the claims at issue, further holding that "application of the doctrine of equivalents as to that [added] element" would be barred unless the patentee could show a reason for the amendment sufficient to avoid estoppel. *Id.* at 33-34, 117 S. Ct. 1040.

Festo too involved amendments that added new limitations to the claims. There two patents were at issue, the Stoll and Carroll patents. During prosecution an additional limitation was added to the Stoll patent requiring that the claimed invention include "a cylindrical sleeve made of a magnetizable material." *Festo II*, 344 F.3d at 1371 (emphasis omitted). An additional limitation requiring "a pair of resilient sealing rings" was also added during reexamination to claim 1 of the Carroll patent, which previously "made no reference to sealing rings." *Id.* at 1372. The Supreme Court referred to both of these amendments as "add[ing] a new limitation," 535 U.S. at 728, 122 S. Ct. 1831, and held that they

gave rise to a presumptive surrender of equivalents. *Id.* at 741, 122 S. Ct. 1831; *see also, e.g., I.T.S. Rubber Co. v. Essex Rubber Co.*, 272 U.S. 429, 443, 47 S. Ct. 136, 71 L.Ed. 335 (1926); *Shepard v. Carrigan*, 116 U.S. 593, 597, 6 S. Ct. 493, 29 L.Ed. 723 (1886) ("Where an applicant for a patent . . . is compelled by the rejection of his application . . . to narrow his claim *by the introduction of a new element*, he cannot after the issue of the patent broaden his claim by dropping the element which he was compelled to include in order to secure his patent." (emphasis added)).

It is therefore clear that the addition of a new claim limitation can give rise to a presumption of prosecution history estoppel, just like an amendment that narrows a preexisting claim limitation. In either case, the narrowing amendment, if made for a reason related to patentability, will give rise to a presumption of surrender. If only narrowing amendments to preexisting claim limitations could give rise to the presumption, the purpose of preventing patentees from recapturing subject matter conceded during prosecution would be undermined. Astute practitioners could, through clever claim drafting, elect to treat most, if not all, amendments as merely adding new claim limitations rather than narrowing preexisting ones. For these reasons, we hold that an amendment adding a new claim limitation constitutes a narrowing amendment that may give rise to an estoppel.

B

We must next address whether rewriting a dependent claim into independent form, coupled with the cancellation of the original independent claim, constitutes a narrowing amendment when the dependent claim includes an additional claim limitation not found in the cancelled independent claim or circumscribes a limitation found in the cancelled independent claim.

In this case there is no question that the original independent claims (application claims 16 and 32 of '893 patent and application claims 48 and 49 of the '194 patent) were rejected for reasons related to patentability. All of the original independent claims were rejected as obvious in view of the prior art. The original independent claim upon which application claim 35 depended was also rejected as indefinite under 35 U.S.C. § 112, paragraph two. These rejected independent claims were cancelled and the dependent claims (application claims 17 and 35 of the '893 patent and claim 51 of the '194 patent) were rewritten into independent form in order to secure their allowance.

A presumption of surrender therefore arises if rewriting the dependent claims into independent form, along with canceling the original independent claims, constitutes a narrowing amendment. Honeywell argues that prosecution history estoppel cannot occur where a dependent claim is merely rewritten into independent claims. Honeywell contends that, although it surrendered its broader independent claim, there is no presumption of

surrender because the scope of the rewritten claims themselves has not been narrowed. We disagree.

In *Festo*, the Supreme Court held that the proper focus is whether the amendment narrows the overall scope of the claimed subject matter. *See* 535 U.S. at 736-37, 122 S. Ct. 1831. There the United States in its *amicus curiae* brief cited the district court's opinion in this very case. Honeywell itself notes that the government in *Festo* urged the Court to adopt the position that rewriting a dependent claim into independent form cannot give rise to a presumption of surrender.[7] (Reply Br. for Pls.-

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[7] The government argued that:

> Patent applicants may amend their patent claims for reasons of patentability--such as to clarify an ambiguous term--that do not result in narrowing the claims and surrendering subject matter. Rather, the amendments may state the same--or broader--patent claims in more precise terms. *For example, an applicant may amend by rewriting a dependent claim as an independent claim. See Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. Civ. A 99-309 GMS, 2001 WL 66348, at *6 (D.Del. Jan. 8, 2001) . . . . *Such amendments do not give rise to prosecution history estoppel*, which has as its core functions preserving the notice function of the claims and preventing patent holders from recapturing under the doctrine of equivalents subject matter that was surrendered before the Patent Office.
>
> Br. for the United States as Amicus Curiae at 16-17, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 122 S.Ct. 1831,

(Continued...)

Appellants at 16-17.) The Supreme Court, while approvingly citing the government's positions with respect to other issues, *see, e.g., Festo*, 535 U.S. at 740, 122 S. Ct. 1831, rejected the position of the government in this respect, stating that rewriting a dependent claim in independent form creates a presumptive surrender if the amendment is "made to secure the patent," *id.* at 736. The Court held that:

> *The PTO might require the applicant* to clarify an ambiguous term, to improve the translation of a foreign word, or *to rewrite a dependent claim as an independent one.* In these cases, petitioner argues, the applicant has no intention of surrendering subject matter and should not be estopped from challenging equivalent devices. While this may be true in some cases, petitioner's argument conflates the patentee's reason for making the amendment with the impact the amendment has on the subject matter. Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patent's scope. If a § 112 amendment is truly cosmetic, then it would not narrow the patent's scope or raise an estoppel. On the other hand, if a § 112 amendment is

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152 L.Ed.2d 944 (2002) (No. 00-1543) (emphases added and internal quotation marks omitted).

> necessary and narrows the patent's scope--even if only for the purpose of better description--estoppel may apply. A patentee who narrows a claim as a condition for obtaining a patent disavows his claim to the broader subject matter, whether the amendment was made to avoid the prior art or to comply with § 112. *We must regard the patentee as having conceded an inability to claim the broader subject matter or at least as having abandoned his right to appeal a rejection. In either case estoppel may apply.*

Id. at 736-37, 122 S. Ct. 1831 (emphases added). Thus, the fact that the scope of the rewritten claim has remained unchanged will not preclude the application of prosecution history estoppel if, by canceling the original independent claim and rewriting the dependent claims into independent form, the scope of subject matter claimed in the independent claim has been narrowed to secure the patent.[8]

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[8] *See also Keith v. Charles E. Hires Co*, 116 F.2d 46 (2d Cir. 1940). In *Keith*, Judge Learned Hand, writing for the court, stated:

> We can see no difference between that situation [where the claim was amended to secure allowance] and one where as here the applicant files a limited and a broader claim at the same time and then cancels the broader one when it has been rejected. The theory of the "estoppel," as it is called is that, by assenting to the

(Continued...)

This is the rule we have consistently applied in our post-*Festo* decisions. First, in *Deering* we held that canceling a broader independent claim and replacing it with a dependent claim rewritten into independent form was a "clear surrender of the broader subject matter" that presumptively barred application of the doctrine of equivalents. 347 F.3d at 1325. There the patentee's original claim 1 defined a portable scale including a sliding weight that moved along a beam to indicate the weight of a load placed on the opposite end. *Id.* at 1317. Dependent claim 3 added a "Zero Position Limitation" requiring that the zero position of the sliding weight be "in an imaginary plane containing the fulcrum of the beam." *Id.* at 1318-19 (emphasis omitted). Claim 1 was rejected as obvious during prosecution. *Id.* at 1319. The patentees cancelled claim 1 and rewrote claim 3 (new application claim 11) in independent form. *Id.* Following the rule announced by the Supreme Court in *Festo*, we rejected the argument that the amendment was merely "cosmetic." *Id.* at 1326. We held that this was a narrowing amendment because "the patentees clearly disclaimed the territory between the original claim 1 and new claim 1 as issued [application claim 11]." *Id.* at 1325. Consequently, the "addition of

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> cancellation of the claim and by amendment it, the applicant has abandoned it as it stood. Certainly it cannot be necessary to this conclusion that he shall amend the cancelled claim, when he has already filed a claim which contains the necessary differentia.
> *Id.* at 48.

independent claim 11, coupled with the clear surrender of the broader subject matter of the deleted original independent claim presumptively" barred the patentee from arguing equivalents related to the zero position of the sliding weight. *Id.*

So too, in *Ranbaxy* the patentee's original independent claim was for a chemical process that involved dissolving starting material into "a highly polar organic solvent." 350 F.3d at 1237. Dependent claims 3, 5 and 7 further limited the highly polar organic solvent limitation of claim 1 to narrower categories of solvents, *i.e.*, sulfoxides, amides and formic acid respectively. *Id.* The examiner rejected claim 1 as obvious and indefinite in the first office action, but indicated that claims 3, 5 and 7 would be allowable if rewritten into independent form. *Id.* at 1238. The patentee responded by canceling claims 1, 3, 5 and 7 and adding new claim 11, which was identical to claim 1 except that it limited the highly polar organic solvent limitation to "the group consisting of a sulfoxide, an amide and formic acid," *i.e.*, the patentee rewrote the dependent claims into a single, new independent claim. *Id.* While noting that the question of whether there was a presumption of estoppel "is best dealt with on a case-by-case basis," *id.* at 1240, we held that if the amendment "surrendered subject matter that was originally claimed for reasons related to patentability," there is a presumption of estoppel, *id.* (quoting *Deering*, 347 F.3d at 1325). Relying on *Festo* and *Deering*, we held that there was a clear surrender of subject matter because the narrower rewritten claim had been substituted for the broader original independent claim. *Id.* As a result, the

patentee was presumed to have "surrendered the equivalents that may have been encompassed by 'highly polar solvent'" as originally claimed. *Id.* at 1241.

The approach of these cases is consistent not only with the language of *Festo*, but also with its theory. In *Festo* the Supreme Court explained that "[a] patentee's decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim." 535 U.S. at 740, 122 S. Ct. 1831. When the scope of the patent claim is narrowed to secure the patent, the court "must regard the patentee as having conceded an inability to claim the broader subject matter." *Id.* at 737, 122 S. Ct. 1831. The scope of the patentee's concession is determined on a limitation-by-limitation basis. *See Festo II,* 344 F.3d at 1367. It necessarily follows that the presumption of surrender applies only to the amended or newly added limitation; there is no surrender of territory as to unamended limitations that were present in the original claim. Thus, when a claim is rewritten from dependent into independent form and the original independent claim is cancelled, "the correct focus is on whether [the] amendment surrendered subject matter." *Ranbaxy*, 350 F.3d at 1240 (quoting *Deering*, 347 F.3d at 1325) (alteration in original). Under such circumstances, the surrendered subject matter is defined by the cancellation of independent claims that do not include a particular limitation and the rewriting into independent form of dependent claims that do include that limitation. Equivalents are

presumptively not available with respect to that added limitation.

In this case there is a presumptive surrender of all equivalents to the inlet guide vane limitation. The only independent claims asserted in this case, claims 4, 8 and 19, were originally dependent on independent application claims 16, 32, 48 and 49, which did not include the inlet guide vane limitation. Claims 4, 8 and 19 included the inlet guide vane limitation. Claims 4, 8 and 19 were rewritten into independent form, and the original independent claims were cancelled, effectively adding the inlet guide vane limitation to the claimed invention. Honeywell is presumptively estopped from recapturing equivalents to the inlet guide vane limitation.

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This however is not the end of the matter. In our first *en banc* decision in *Festo*, 234 F.3d 558, we held that narrowing a claim element results in a complete surrender of equivalents with respect to that element. *Id.* at 574. The Supreme Court disagreed. While holding that under such circumstances there was a presumptive surrender as to the entire limitation, the Court held that this presumption could be rebutted in one of three ways. *See Festo*, 535 U.S. at 740-41, 122 S. Ct. 1831. As made clear in *Festo II*, the patentee can rebut the presumption of surrender by showing either:

> that the alleged equivalent would have been unforeseeable at the time of the

> narrowing amendment, that the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent in question, or that there was some other reason suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent.

344 F.3d at 1368 (quoting *Festo*, 535 U.S. at 741, 122 S. Ct. 1831). As was the case in *Festo II*, we think the issue of whether the patentee can overcome the presumption is best addressed, in the first instance, by the district court, and we remand for that purpose.

We do not address Sundstrand's other challenge to the verdict of infringement since it is conceded that the jury verdict cannot stand if Honeywell is not entitled to equivalents with respect to the inlet guide vane limitation. In view of our disposition vacating the judgment of infringement, we also need not address Honeywell's challenges to the district courts rulings limiting damages.

II. Invalidity

We turn now to the issue of Sundstrand's counterclaims for invalidity. Sundstrand argues that the asserted claims for the '893 and '194 patents are invalid under the on-sale bar, anticipated and obvious. Since the ultimate issue of validity was submitted to the jury, we assume that all underlying factual issues were resolved in favor of the verdict

winner. *Hewlett-Packard*, 340 F.3d at 1325. We review the jury's factual determinations for substantial evidence. *Id.; Minn. Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1305 (Fed. Cir. 2002).

Substantial evidence supports the jury's conclusion that the claims at issue were not invalid under the on-sale bar. Under *Pfaff v. Wells Electronics, Inc.*, 525 U.S. 55, 119 S. Ct. 304, 142 L.Ed. 2d 261 (1998), the on-sale bar cannot arise unless the invention was (1) the subject of a commercial offer for sale and (2) "ready for patenting" prior to the critical date. *Id.* at 67, 119 S. Ct. 304. An invention is ready for patenting if it was "reduce[ed] to practice before the critical date; or [if] prior to the critical date the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention." *Id.* at 67-68, 119 S. Ct. 304. Here Sundstrand urges that certain drawings, substantially identical to those in the '893 and '194 patents, prove that Honeywell's invention was ready for patenting prior to the critical date. Honeywell disagrees. Its expert, Mr. Muller, testified that the drawings relied upon by Sundstrand would not allow "any engineer that [he] kn[ew] of with any amount of experience, to simply take [those drawings] and go off and design a surge control system" because "the details and the operation of the figures themselves are of little or no use in being able to discern how the system operates." (J.A. at 16613-14.) The jury was entitled to resolve the conflicting evidence in favor of Honeywell, *Bio-Tech. Gem. Corp. v. Genentech, Inc.*,

267 F.3d 1325, 1330-31 (Fed. Cir. 2001), particularly given the heavy burden to establish invalidity by clear and convincing evidence. Thus, we agree with the district court that substantial evidence supports the jury's verdict that the claimed invention was not ready for patenting prior to the critical date and not invalid under the on-sale bar.[9]

The jury's findings that the '893 and '194 patents are not anticipated or obvious are also supported by substantial evidence. On the issue of anticipation, Sundstrand argues that one reference in particular, the Warnock article, anticipates all of the asserted claims. Not surprisingly, the expert testimony presented at trial took opposing views on whether the Warnock article disclosed a system capable of maintaining an essentially constant minimum flow rate, as the claims require. In view of this evidence, we agree with the district court that there was substantial evidence to support the jury's finding of no anticipation. Sundstrand contends that, even if not anticipating, the prior art renders claims 8, 10, and 11 of the '893 patent obvious. However Honeywell's expert, Mr. Muller, testified that the patented invention differs in both function and structure from that described by the prior art. He testified that the prior art did not "have a

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9 Because we find that substantial evidence supports the jury's finding that the invention was not ready for patenting prior to the critical date, we do not decide whether the agreement and subsequent papers constituted an offer to sell.

proportional and integral controller, but only . . . a proportional controller" and that as a result the prior art "var[ied] the flow in order to get away from surge whereas the patented invention was able to "maintain a constant flow." (J.A. at 16, 612.) Evidence of commercial success and copying was also introduced. In light of this evidence, we again agree with the district court that there is substantial evidence to support the jury's finding of nonobviousness. We further conclude that the district court did not abuse its discretion in denying Sundstrand's motion for a new trial on any of the asserted grounds for invalidity.

CONCLUSION

For the forgoing reasons, we conclude that the amendments made during prosecution give rise to a presumptive surrender of equivalents for the inlet guide vane limitation. Consequently, we vacate the judgment of infringement under the doctrine of equivalents and remand to the district court to consider whether Honeywell can rebut that presumption under the *Festo* criteria. We affirm the district court's judgment that the asserted claims of the '893 and '194 patents are not invalid. Because the judgment on liability has been vacated, we do not reach Sundstrand's argument regarding the sufficiency of evidence supporting the verdict of infringement, nor do we reach Honeywell's arguments on damages.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

Each party shall bear its own costs.

PAULINE NEWMAN, Circuit Judge, dissenting in part.

Today the court changes the law in two new ways. The first way is directly contrary to statute. The second is simply another restriction on equivalency, far exceeding the holdings of the Supreme Court in *Festo* and *Warner-Jenkinson*.

Contrary to 35 U.S.C. § 112 ¶ 4, the court now holds that the act of restating a dependent claim in independent form is a "narrowing amendment" in terms of *Festo*, although the claim had never been rejected or amended or narrowed. From this premise the court holds that all elements of the restated claim are subject to the presumption of surrender of all equivalents, whenever the antecedent independent claim is cancelled. Thus a limitation that has never been narrowed is subject to the presumption of surrender when a broader claim is cancelled, even when the broader claim did not mention that limitation. That is not in accordance with the Court's holding in *Festo*.

This new rule will simply drive patent applicants away from dependent claims and away from the accepted protocol of presenting successively narrowed dependent claims for examination. This new rule will simply raise the cost and increase the difficulty of patent examination. By adding presumptive estoppels to elements and limitations

that were never a basis of rejection and never narrowed during examination, the court further erodes the ability of inventors to protect their inventions. Although the majority attributes its ruling to the Supreme Court, this new leap for inventors is not the Court's work but that of my colleagues. I respectfully dissent.

Restating a Dependent Claim in Independent Form is Not a Change in Scope

The court holds that the placing of a dependent claim in independent form, when required only because the antecedent independent claim was cancelled, is a narrowing amendment as to all elements and limitations of the restated claim. That ruling is contrary to statute. When a dependent claim is placed in independent form, it simply states explicitly what was previously incorporated by reference:

> 35 U.S.C. § 112 ¶ 4. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers. Restating a dependent claim in independent form does not change its content or scope; the claim is of identical content and scope before and after it is rewritten. *See, e.g., Bloom Eng'g Co. v. N. Am. Mfg. Co.*, 129 F.3d 1247, 1250 (Fed. Cir. 1997) ("Bloom did no more than restate original claims 7 and 18 in independent form. . . . Thus this change, standing alone, did not

> change the scope of original claims 7 and 18."); *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1553 (Fed. Cir. 1989) ("The jury was properly instructed that a dependent claim includes all the limitations of the claim from which it dependents . . ."); *Hartness Int'l Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108 (Fed. Cir. 1987) ("[D]ependent claim 3 included all the limitations of claim 1, with the further limitation of tapered partitions").

35 U.S.C. § 112 ¶ 4 assured that claim scope is unrelated to whether the claim is in independent or dependent form. The Court in *Festo*, did not change that law. My colleagues not only impose the presumptive surrender of *Festo*, but also presume estoppel against the entire universe of technology. That is, instead of presuming surrender of the territory between the original scope of the claimed element and the scope of that element after a narrowing amendment--the rule developed in *Festo*--the court now presumes unlimited surrender when an element was not originally claimed at all and therefore presents no outer limit of surrendered territory.

The Court in *Festo* established a presumption of surrender of the territory between the original scope of the claim and its amended scope. My colleagues now hold that all equivalents, without limit, are presumptively surrendered when the element was not initially claimed, whenever a

dependent claim is required to be restated because the antecedent claim was cancelled.

The Honeywell dependent claims added the inlet guide vanes element and what the parties call the deltaP limitation.[1] Although these additions

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1 The claims at issue, in their original dependent form, were as follows:

> 17. The accessory power unit of Claim 16 wherein said compressor has adjustable inlet guide vanes, the value of said flow-related parameter is substantially independent to the temperature of the compressed air, said comparator means have an adjustable control set point representing said desired value of said parameter, and said accessory power unit further comprises means for transmitting to said comparator a reset signal for varying said set point as a function of the position of said inlet guide vanes in accordance with a predetermined reset schedule.
>
> 35. The control system of Claim 32 wherein the compressor has adjustable inlet guide vanes, and said control system further comprises a guide vane position sensor and a function generator coupled in series between the inlet guide vanes and said input portion of said comparator.
>
> 51. The method of Claim 49 wherein the compressor has adjustable inlet guide vanes, and said method further comprises the step of adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes.

(Continued...)

were never narrowed by amendment (or argument), the court holds that they are subject to a presumption of surrender of all equivalents, simply because the antecedent claim was rejected and dropped. However, the antecedent claim did not mention any sort of inlet guide vane or any version of deltaP; these aspects were not previously claimed, and were not amended or narrowed at any time during prosecution.

Thus the court achieves the far-reaching new rule that an element or limitation contained in a dependent claim, although never narrowed and never subject to any ground of rejection, has presumptively surrendered all equivalents. These limitations are now barred from access to routine function/way/result equivalency (the formula of *Graver Tank*), and can reach equivalents only on the *Festo* grounds that apply to elements that have had narrowing amendments, *viz.*, unforeseeability and tangentialness.

In so holding, the court ignores its own en banc pronouncement on the applicability of prosecution history estoppel. This court held, upon remand of the *Festo* case from the Supreme Court, that "[t]he first question in a prosecution history

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The claims were held allowable on the first examiner's action, but were "objected to" as to dependent form. (Claim 35 was also rejected as indefinite under 35 U.S.C. '112; this rejection was overcome by amendment to other elements, not here at issue.)

estoppel inquiry is whether an amendment filed in the Patent and Trademark Office has narrowed the literal scope of a claim. If the amendment was not narrowing, then prosecution history estoppel does not apply." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359, 1366-67 (Fed. Cir. 2003). Because restating a claim in independent form does not narrow the literal scope of the claim, every claim at issue in this case is of precisely the scope it had when originally filed. There was no narrowing of the scope of any claim at issue, or of any element or limitation of any claim at issue. Therefore, the claim does not pass the "first question" announced by this court, and "prosecution history estoppel does not apply."

Dependent Claims are an Examination Convenience

The use of dependent claims is encouraged by the patent examining authority as an aid in examination. Its value during examination is reflected in the significantly lower fees charged for examination of dependent claims.

In earlier practice, the Patent Office required that "each claim should be drawn complete in itself." *In re Sexton*, 1873 C.D. 66 (Comm'r Pat. 1873). By the early twentieth century the Office recognized that for clarity, brevity, and convenience the use of dependent claims "would reduce the number of claims and make division between independent inventions clear and easy" because "such a claim would be self-analyzing and self-classifying, and therefore make the examination of the claim easier."

Ex parte Brown, 1917 C.D. 22 (Comm'r Pat. 1917). Statutory recognition of dependent claims occurred in 1965, amending § 112 to recognize dependent claims, amending § 282 to state the presumptive validity of dependent claims, and § 41 to reduce the fee for dependent claims. Act of July 24, 1965, Pub. L. 89-83, 79 Stat. 259. The legislative Report stated that the purpose was "to make clear that dependent claims are to be considered individually on their merits." S.Rep. No. 89-301 at 4 (1965), reprinted in 1965 U.S.C.C.A.N. 2315, 2319. In 1975 Title 35 was further amended in connection with the Patent Cooperation Treaty "to take account of a more liberal claim drafting practice in permitting multiple dependent claims as provided by the Treaty." H.R.Rep. No. 94-592, at 4 (1975), reprinted in 1975 U.S.C.C.A.N. 1220, 1224 (referencing Act of Nov. 14, 1975, Pub.L. 94-131 §§ 3, 7, 10, 89 Stat. 685, 690-92).

Each claim defines a separate invention, whether or not written in independent form; and its validity stands or falls separately:

> 35 U.S.C. § 282 Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of the other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim.

A dependent claim is independently valid, and is not narrowed by the cancellation of its antecedent claim. *See Altoona Publix Theatres, Inc. v. American Tri-*

Ergon Corp., 294 U.S. 477, 487, 55 S. Ct. 455, 79 L.Ed. 1005 (1935) ("Under the statute it is the claims of the patent which define the invention. And each claim must stand or fall, as itself sufficiently defining invention, independently of the others.") (citations omitted). "[E]ach claim must be considered as defining a separate invention." *Jones v. Hardy*, 727 F.2d 1524, 1528 (Fed. Cir. 1984). *See Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1220 (Fed. Cir. 1995) ("[E]ach claim is a separate statement of the patented invention").

A Claim is Not Narrowed by Cancelling its Antecedent Claim

By statute it is irrelevant whether a claim is in dependent or independent form; it is not a narrowing amendment to go from dependent form to independent form. The majority opinion searches for and finds a narrowing amendment in the cancellation of the broader antecedent claim. However, for the claims here at issue, there was no narrowing amendment of any of the elements or limitations at issue, in any claim.

The majority opinion changes the basic premise of presentation of claims of varying scope and divergent content, in holding that by dropping a broader claim, the claims subordinate to that claim became subject to presumptive estoppel, whether or not the subject matter at issue was included in the broader claim. That is far removed from the Court's holding in *Festo*. Although the majority quotes the Court's statement that "a narrowing amendment made to satisfy any requirement of the Patent Act

may give rise to an estoppel," 535 U.S. at 736, 122 S. Ct. 1831, restating a dependent claim into an independent claim of identical scope is not a narrowing amendment; and canceling a broader claim (especially one that does not mention the element at issue for equivalency) is not a narrowing amendment.

In *Festo* the Court recognized that some § 112 amendments are substantive but that other § 112 amendments are formal:

> Petitioner contends that amendments made to comply with § 112 concern the form of the application and not the subject matter of the invention. The PTO might require the applicant to clarify an ambiguous term, to improve the translation of a foreign word, or to rewrite a dependent claim as an independent one. In these cases, petitioner argues, the applicant has no intention of surrendering subject matter and should not be estopped from challenging equivalent devices. While this may be true in some cases, petitioner's argument conflates the patentee's reason for making the amendment with the impact the amendment has on the subject matter. Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patent's scope. If a § 112 amendment is truly cosmetic, then it would not narrow the patent's

> scope or raise an estoppel. On the other hand, if a § 112 amendment is necessary and narrows the patent's scope--even if only for the purpose of better description--estoppel may apply.

Festo, 535 U.S. at 736-37, 122 S. Ct. 1831. The majority states that in this passage the Court "rejected the position of the government [that rewriting a dependent claim into independent form does not give rise to a presumption of surrender], stating that rewriting a dependent claim in independent form creates a presumptive surrender if the amendment is 'made to secure the patent.'" Maj. op. at 1143-44. Neither this passage, nor any other, so holds. Indeed, the Court explained that the criterion is whether the § 112 amendment was a narrowing amendment, stating that "it may be true in some cases" than an amendment under § 112 does not trigger prosecution history estoppel. *Festo*, 535 U.S. at 736, 122 S. Ct. 1831.

Rewriting of a claim in accordance with 35 U.S.C. § 112 ¶ 4 can never be a narrowing amendment, because, by statute, rewriting a dependent claim in independent form does not narrow the claim's scope. The Court did not purport to overturn that well-respected law. Although it is well established that the prosecution of an element in other claims may affect the scope of that element in all claims, as discussed *post*, the court today rules that the mere presentation of a new element in a dependent claim raises the presumption of surrender of all equivalents of that element whenever the

antecedent claim is cancelled. That is simply incorrect.

In the Honeywell claims the newly added element was never the subject of rejection or amendment during prosecution. It is irrelevant whether that element first appeared in a dependent or an independent claim. It is a new and unwarranted enlargement of *Festo*'s law of presumptive surrender, to hold that this presumption arises automatically as to elements that were never rejected, never amended, and never at issue during prosecution, whenever a broader claim is cancelled.

The question is not whether a claim that contains more limitations--for example, a claim that names more parts of a mechanical device--is narrower than a claim that names fewer parts. Of course a claim with more limitations is narrower than a claim with fewer limitations. The issue is whether a claimed element that has never been amended is always subject to the restricted access to equivalency that flows from presumptive surrender based on a narrowing amendment.

According to my colleagues, no element/limitation added by dependent claim, although never rejected, can achieve *Graver Tank* function/way/result equivalency, when the antecedent claim is cancelled for reasons of patentability. That is not what the Court in *Festo* held. The Court stated that there was no per se rule for the group of § 112 amendments that are formalistic instead of substantive, and that the

"impact on the subject matter" must always be considered. For example, if the dependent claim were itself rejected for reasons of patentability, it is irrelevant whether the claim is in dependent or independent form. However, when, as here, the dependent claim was *never* rejected, the act of rewriting the dependent claim does not raise a presumptive estoppel to equivalency, whether or not the antecedent claim is cancelled. The Court's *Festo* opinion does not state otherwise.

The Honeywell claims in suit were not rejected on any ground, although the independent claims were rejected on substantive grounds. The district court applied the Federal Circuit's 2002 opinion (before vacatur by the Supreme Court), and on those rigorous grounds of estoppel the district court ascertained which elements or limitations were asserted to be infringed by an equivalent, determined that they involve the inlet guide vanes and the deltaP parameter, and observed that these aspects were not amended during prosecution and were not a subject of rejection. The district court correctly held that these claims were amenable to *Graver Tank* equivalency, and instructed the jury accordingly.

Cancelling an independent claim in favor of a dependent claim restated in independent form, is not the same as making a narrowing amendment to a claim. It is not notice of a retrenchment in the scope of the dependent claim. *See Schwing GmbH v. Putzmeister Aktiengesellschaft*, 305 F.3d 1318, 1324 (Fed. Cir. 2002) ("Although prosecution history can be a useful tool for interpreting claim terms, it

cannot be used to limit the scope of a claim unless the applicant took a position before the PTO that would lead a competitor to believe that the applicant had disavowed coverage of the relevant subject matter."). Merely canceling a broad claim is not a signal to competitors that the patentee disavowed all equivalents of the elements and limitations of remaining claims that were never rejected during prosecution.

The "Objection" to the Honeywell Claims During Examination

The claims at issue were never rejected during patent examination, on prior art or any other ground. They were held to recite allowable subject matter in the first action by the examiner, but because they depended from claims that had been rejected, the examiner "objected" to them.

When the form of a claim is improper, the examiner issues an "objection" rather than a "rejection." MPEP § 706.01 (8th Ed. 2001) discusses this distinction:

> The refusal to grant claims because the subject matter as claimed is considered unpatentable is called a "rejection." . . . If the form of the claim (as distinguished from its substance) is improper, an "objection" is made. An example of a matter of form as to which objection is made is dependency of a claim on a rejected claim, if the

> dependent claim is otherwise allowable. *See* MPEP § 608.01(n).

MPEP § 608.01(m) lists various grounds of objection to the form of claims, and in *Ex parte Porter* the Board explained that the question of dependent form is formal, not substantive:

> [MPEP § 608.01(n)] properly treats a claim considered to be an improper dependent claim an administerial function or formal matter wherein the examiner's ruling can be challenged by way of petition under 37 C.F.R. § 1.181 rather than by appeal under 37 C.F.R. § 1.191.

Ex parte Porter, 25 USPQ2d 1144, 1147 (Bd. Pat. App & Interf. 1992). The examiner stated that the Honeywell claims in suit were allowable, and would be allowed if placed in independent form. Honeywell then simply cancelled all of the rejected claims, without amendment or argument concerning the rejection, and placed the "objected to" claims in independent form. These claims were then issued. Their scope was never changed. No change was made in any element or limitation, while in either dependent or independent form. The inlet guide vanes and deltaP were not mentioned in any cancelled independent claim, had not been claimed more broadly in any rejected claim, and were not the subject of amendment or argument. These limitations appeared only in the original dependent claims, and were unchanged when the claims were restated in independent form. There was no

narrowing amendment. This is a conspicuous distinction from the precedent relied on by the majority.

The district court correctly analyzed this precedent. In *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 681 (Fed. Cir. 1988) the patentee had presented arguments that expressly surrendered the scope being claimed as an equivalent; this court properly held that these arguments applied to all claims, whether or not the claims had themselves been amended. Similarly in *Builders Concrete, Inc. v. Bremerton Concrete Prods. Co.*, 757 F.2d 255, 260 (Fed. Cir. 1985), this court held that although the claim in suit had not been amended, "the precise subject matter that was relinquished in order to obtain allowance" of a different claim, could not be recaptured under the doctrine of equivalency. In these cases the asserted equivalent had been expressly disclaimed or relinquished during prosecution.

This law is well-established, as reflected in the recent *Deering* and *Ranbaxy* cases, on which the majority places heavy reliance. As stated in *Deering Precision Instruments, L.L.C. v. Vector Distribution Sys., Inc.*, 347 F.3d 1314, 1325 (Fed. Cir. 2003), "the correct focus is on whether the amendment surrendered subject matter that was originally claimed for reasons related to patentability." In *Deering* the original independent claim was directed to a scale that comprised "a sliding weight movably carried by said beam for movement along said scale," and a dependent claim limited the sliding weight element of the independent claim by further

requiring that it contain a "zero position." This court held that the territory between the zero position of the sliding weight in the dependent claim and the unlimited position of the sliding weight in the cancelled claim was subject to *Festo* estoppel. That holding is in accord with conventional estoppel and element-by-element analysis.

Similarly in *Ranbaxy Pharms. Inc. v. Apotex, Inc.*, 350 F.3d 1235, 1240 (Fed. Cir. 2003), the original independent claim contained the description "highly polar organic solvent," and dependent claims added solvent categories of sulfoxides, amides, and formic acid. The broad "highly polar organic solvent" was rejected on prior art and the applicant cancelled that claim, retaining the dependent claims' sulfoxides, amides, and formic acid. The dependent claims were then restated in independent form. The court correctly applied *Festo* estoppel to Ranbaxy's assertion of equivalency of other polar solvents. The court applied the rules of estoppel to these narrowed claim limitations; the form of the claims was irrelevant.

Applied to the Honeywell claims, the inlet guide vanes element and deltaP limitation were not narrowed by amendment. The dependent claims added these new features, not present in the original independent claim. In contrast, in *Deering* and *Ranbaxy* the dependent claim limited an element of the original independent claim, raising the presumption of surrender of "all territory between the original claim limitation and the amended claim limitation." *Festo*, 535 U.S. at 740, 122 S. Ct. 1831. In contrast, in the Honeywell situation the inlet

guide vanes and deltaP were not claimed in any scope, and there was no surrendered territory of inlet guide vanes and deltaP.

The court thus imposes an unbounded estoppel, for there is no measure of the yielded territory. However, the proper focus is the prosecution-induced change to the element at issue. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29, 117 S. Ct. 1040, 137 L.Ed.2d 146 (1997) (equivalency is determined element by element). It is necessary, to implement *Festo* and *Warner-Jenkinson*, to determine whether the dependent claim added a new element or simply limited an existing element. The decision-maker can then determine the scope of the intervening territory, imposing the *Festo* restrictions on equivalency when there is a presumption of surrender, or the equivalency principles of *Graver Tank* when there is no presumption of surrender.

The Challenge to Patentees

My colleagues state that they are preventing subversion of the court's attempts to restrain access to equivalency, by preventing "astute practitioners, through clever claim drafting, from elect[] to treat most, if not all, amendments by merely adding new claim limitations rather than narrowing preexisting ones." Maj. op. at 1141-42. Indeed, it has long been the practice to add new limitations in subordinate claims.

The court holds: "we hold that an amendment adding a new claim limitation constitutes a

narrowing amendment that may give rise to an estoppel." That holding is seriously flawed, for it holds that no subordinate claim can avoid presumptive surrender and estoppel whenever a broader claim is cancelled. Yet the writing of broader claims and their cancellation during prosecution is, or was, the common practice. Astute practitioners are indeed needed, for little is left of access to equivalency.

Today's new rule solves no problem, rights no wrong, addresses no unmet need. Future applicants may attempt to obtain access to the doctrine of equivalents through avoiding dependent claims. Patent applications will cost more, since independent claims carry a heavier fee than dependent ones. There will be more opportunities for mistakes, and insignificant changes in the working of limitations that would have been incorporated by reference will be fodder for litigation. Examination will probably take longer, because the use of dependent form adds organization to the claims and makes them easier to understand. The losers are those patentees who had no reason to foresee today's new rule, and future patentees who will have to cope with it.

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

No. Civ. A. 99-309 GMS.
September 27, 2001

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant.

Josy W. Ingersoll, Melanie Sharp, and Christian D. Wright of Young Conaway Stargatt & Taylor LLP, Wilmington, DE. Of Counsel: Jonathan F. Putnam, Todd S. Schulman, Lee Ann Stevenson, and Victoria Reznik of Kirkland & Ellis, New York, NY, Robert J. Krupka, Kirkland & Ellis, Los Angeles, CA. Attorneys for Plaintiff.

Richard D. Kirk, Morris, James Hitchens & Williams LLP, Wilmington, DE. Of Counsel: Richard F. Ziegler, David H. Herrington, Justin S. Anand, Cleary, Gottlieb, Steen & Hamilton, New York, NY, William E. McCracken. G. Christopher Braidwood, Thomas Miller, Marshall O'Toole,

Gerstein, Murray & Borun, Chicago, IL. Attorneys for Defendant.

MEMORANDUM OPINION

SLEET, District Judge.

I. INTRODUCTION

On May 17, 1999, Honeywell International, Inc. ("Honeywell") brought this action against Hamilton Sundstrand Corporation ("Sundstrand") alleging that Sundstrand's manufacture and sale of the APS 3200 infringes its 4,380,893 and 4,428,194 patents (the "'893 patent" and "'194 patent," respectively). The patents-in-suit relate to technology for an airplane auxiliary power unit ("APU"). An APU is a small gas turbine engine, usually placed in the tail section of an airplane, that generates electricity for use while the aircraft is on the ground or in flight. An APU also provides compressed air for both starting the aircraft's main engine and environmental control of cabin air. The '893 and '194 patents cover a method for controlling surge, which is an aerodynamic phenomenon in which the air being drawn into the APU reverses direction and can damage the engine.
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A jury trial was held between 5 and February 16, 2001. On February 16, 2001, the jury returned a verdict finding that: (1) Sundstrand infringed five claims of the '893 patent under the doctrine of

equivalents, (2) Sundstrand infringed Claim 4 of the '194 patent under the doctrine of equivalents, (3) Sundstrand's patent infringement was willful, (4) the patents-in-suit were valid and (5) Honeywell was entitled to price erosion damages in the amount of $45,000,000 and reasonable royalty damages in the amount of $1,578,065.

During the course of the trial, both parties properly moved for judgment as a matter of law pursuant to Rule 50 of the Federal Rules of Civil Procedure--Sundstrand moved for judgment as a matter of law at the close of Honeywell's case-in-chief, Honeywell moved for judgment as a matter of law at the close of Sundstrand's case-in-chief. The court reserved judgment on all JMOL motions. Following the jury's verdict, both parties filed post-trial motions. Presently before the court is (1) Honeywell's renewed motion for judgment as a matter of law on the issue of literal infringement of Claim 4 of the '194 patent, (2) Sundstrand's renewed motions for judgment as a matter of law, or alternatively, for a new trial under Rule 59 of the Federal Rules of Civil Procedure, on the issues of liability, validity and willfulness, and (3) Honeywell's motion for treble damages, attorney's fees, costs and expenses, and pre-judgment interests. The following is the court's decision on all pending post-trial motions.

II. STANDARD OF REVIEW

A. Judgment as a Matter of Law

Under Rule 50 of the Federal Rules of Civil Procedure, a court should grant a motion for judgment as a matter of law only where "there is no legally sufficient basis for a jury to find for [the non-moving] party." *See* Fed. R. Civ. P. 50. Thus, in order to prevail on a renewed motion for JMOL following a jury trial, the moving party "'must show that the jury's findings, presumed or express, are not supported by substantial evidence, or, if they were, that the legal conclusions implied [by] the jury's verdict cannot in law be supported by those findings.'" *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir. 1998) (quoting *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984)). In order to determine whether a legally sufficient basis in fact exists, the trial court must consider all the evidence in a light most favorable to the non-movant, must not determine the credibility of witnesses, and must not substitute its choice for that of the jury. *See Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1269 (Fed. Cir. 1999) (citations omitted). If, after this analysis, substantial evidence, exists to support the jury's verdict, then the motion for JMOL must be denied. *See id.*

The essential question in deciding a motion for judgment as a matter of law is whether the evidence the jury could have believed in reaching its verdict was substantial enough to support its findings. *See Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1573 (Fed. Cir. 1986). Thus, the question

is not what the court might have believed, but what the jury could have reasonably determined. *See Dawn Equip. Co. v. Kentucky Farms, Inc.*, 140 F.3d 1009, 1014 (Fed. Cir. 1998) ("the inquiry is whether a reasonably jury, given the record before it viewed as a whole, could have arrived at the conclusion it did.").

B. Motion for a New Trial

Under Federal Rule of Civil Procedure 59(a), "a new trial may be granted to all or any of the parties and on all or part of the issues in an action in which there has been a trial by jury, for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States." Fed. R. Civ. P. 59(a). The decision to grant or deny a new trial is within the sound discretion of the court. *Allied Chemical Corp. v. Daiflon, Inc.*, 449 U.S. 33, 36, 101 S. Ct. 188, 66 L.Ed.2d 193 (1980). Moreover, the standard for grant of a new trial is less rigorous than the standard for grant of judgment as a matter of law in that the court need not view the evidence in the light most favorable to the verdict winner. *LifeScan Inc. v. Home Diagnostics, Inc.*, 103 F.Supp.2d 345, 350 (D.Del. 2000) (citations omitted). Among the most common reasons for granting a new trial are the following: (1) the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) newly discovered evidence exists that would likely alter the outcome of the trial; (3) improper conduct by an attorney or the court unfairly influenced the verdict; or (4) the jury's verdict was facially inconsistent. *Id.*

Finally, the court is particularly mindful that it must not substitute its own judgment of the facts and the credibility of witnesses for those of the jury, but rather, that it should grant a new trial on the basis that the verdict was against the weight of the evidence only where a miscarriage of justice would result if the verdict were to stand. *See Williamson v. Consolidated Rail Corp.*, 926 F.2d 1344, 1352 (3d Cir. 1991); *EEOC v. State of Delaware Dept. of Health and Social Services*, 865 F.2d 1408, 1413 (3d Cir 1989).

III. DISCUSSION

A. Honeywell's Motion for Judgment as a Matter of Law

1. Whether Honeywell is Entitled to Judgment on Literal Infringement of Claim 4 as a Matter of Law?

Honeywell moves for a judgment as a matter of law reversing the jury's findings that the APS 3200 did not literally infringe Claim 4 of the '194 patent. Honeywell argues that it entitled to judgment as a matter of law because it met its burden of proving a prima facie case of infringement by establishing at trial that Sundstrand's APS 3200 surge control system literally infringed Claim 4 of the '194 patent. Honeywell further contends that in response to its prima facie case of infringement, Sundstrand failed to present evidence, which would support Sundstrand's contentions of non-infringement.

Literal infringement of a claim occurs when every limitation recited in a claim appears in the accused device, i.e., when "the properly construed claim reads on the accused device exactly." *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1358 (Fed. Cir. 2000). At trial, Honeywell had the burden of proving literal infringement by a preponderance of the evidence that the APS 3200 includes each and every element found in Claim 4 of the '194 patent. *See Southwall Technologies, Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995). The court must emphasize that on a JMOL motion, this burden is especially high. *See LNP Eng'g Plastics, Inc. v. Miller Waste Mills, Inc.*, 77 F.Supp.2d 514, 547 (D. Del. 1999). The court may grant JMOL in favor of the party bearing the burden of proof only where (1) the movant has established its case by evidence that the jury would not be at liberty to disbelieve and (2) the only reasonable conclusion is in the movant's favor. *See id.*

Because the parties dispute whether there is substantial evidence to support the jury's verdict that the APS 3200 does not literally infringe Claim 4 of the '194 patent, the court will first set forth the claims of the '194 patent and then describe the evidence presented at trial.

a. Claim 4 of the '194 Patent

Claim 4 of the '194 patent states:

A method of utilizing a compressor of a gas turbine engine to power pneumatically-operated apparatus having a variable inlet air flow demand, the

compressor having adjustable inlet guide vanes, said method comprising the steps of:

(a) interconnecting a supply duct between the compressor and the pneumatically-operated apparatus;

(b) flowing discharge air from the compressor through said supply duct to the pneumatically-operated apparatus;

(c) maintaining an essentially constant minimum supply duct flow rate, despite fluctuations in the flow rate of air received by the pneumatically-operated apparatus, by exhausting air from said supply duct in response to variations therein of the value of a predetermined, flow-related parameter, the flow rate of air exhausted from said supply duct being related to the magnitude of said parameter value variations in both a proportional and time-integral manner, said maintaining step including the steps of providing an outlet passage from said supply duct, positioning in said outlet passage a surge bleed valve operable to selectively vary the flow of air outwardly through said outlet passage, generating a proportional control signal in response to said variations in said flow-related parameter, and simultaneously utilizing said integral and proportional control signals to operate said surge bleed valve; and

(d) adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter

variations as a function of the position of the inlet guide vanes.[1]

b. Honeywell's Evidence Supporting Infringement

Honeywell argues that at trial, it presented substantial, competent evidence that Sundstrand's APS 3200 surge control system literally infringed Claim 4 of the '194 patent. According to Honeywell, this evidence took the form of the testimony of Honeywell's technical expert, Gerard Muller, stipulated facts, and admissions by Sundstrand's own witnesses and documents.

Honeywell's expert, Gerard Muller ("Muller"), is an expert in the design and application of gas turbine engines and compressors. At trial, Muller testified that elements 4(a) & (b) were literally present in Sundstrand's APS 3200. *See* Transcript of Trial, Feb. 5-Feb. 16, 2001 ("Tr.") at 640. As to element 4(c), Muller testified that the APS 3200 also literally maintains a constant minimum flow rate in the supply duct by using a flow-related parameter, called delta P over P or DELPQP, to control the amount of air that is exhausted from the aircraft. He also stated in regard to element 4(c) that the rate of air sent from the supply duct in the APS 3200 is related to variations in a proportional and time integral manner. *See* Tr. 641-652. Finally, Muller

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1 Claims 4(a) & (b) are not at issue. Thus, the court will only discuss Claims 4(c) & 4(d).

testified that as to element 4(d), the APS 3200 also used the position of inlet guide vanes ("IGV") to adjust "the actual relationship of the proportional and integral controllers as it relates to the flow parameter, . . . which is another way of saying, . . . [it] adjusts these values to accommodate for the fact that there is a variation-- that there is a part of the flow control where it--there is no chance for surge, and the lower part of the flow curve, where there is the possibility of surge, referred to as high flow and low flow." Tr. 656-57.

c. Sundstrand's Evidence of No Literal Infringement

At trial, Sundstrand relied primarily upon the testimony of its technical expert, Francis G. Shinskey ("Shinskey").[2] Shinskey explained the differences between Claim 4 of the '194 patent and the APS 3200. In direct contradiction to Muller's testimony Shinskey identified the key distinctions between the accused device and the patents-in-suit as: "the difference in the flow-related parameter, as I said DELPQP is not a flow-related parameter [as in element 4(c)], and secondly, there is the element D of the Claim 4 [that is] completely absent from the APS 3200." Tr. at 1408.

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2 In addition to the testimony of Shinskey, Sundstrand engineer John Szillat ("Szillat") also stated that the APS 3200 did not literally infringe elements 4(c) & 4(d) of the '194 patent.

In further elaborating the differences between the accused product and element 4(c), Shinskey testified that the APS 3200 lacks a flow-related parameter and, therefore, does not satisfy element (c)'s requirement of measuring a flow-related parameter. In defining DELPQP, which Sundstrand identifies as a "Static Pressure Parameter," Shinskey explained that: "There is no flow meter in the APS 3200 used for surge control. The measurable variable used for surge control in the APS 3200 is a combination of the differential pressure taken across the diffuser, which is an integral part of the compressor and the pressure that is measured at the discharge of the compressor." Tr. 1356. Shinskey went on to explain that "[t]he DELPQP measurement is really a composite measurement. It includes compression ratio along with flow." Tr. 1357.

Shinskey also explained that the APS 3200 does not literally infringe element 4(d) of the '194 patent because it does not use inlet guide vane position in the same way as the patent. As to IGV position, Shinskey testified that,

> [i]n case of the APS 3200, IGV position has a completely different function [from the patented invention]. Its function is to lock out the P and I controller from even moving the bleed valve. And the way in which it does it is to -- through the bleed select logic is to throw a switch disconnecting the P and I controller. And finally, the results are completely different. The result of the

> use of IGV position in the patent is to be sure that the surge controller operate[s] at a safe set point at all conditions of IGV position, whereas in the-the result in the case of the APS 3200, is to insure that when we are an in the high flow condition, the surge controller, the P and I controller does not operate the bleed valve. So all three are different. Tr. 1401.

d. Whether JMOL is Warranted in This Case?

Honeywell asserts that it is entitled to JMOL because none of Sundstrand's defenses to infringement provide a legally sufficient basis to support the conclusion that the APS 3200 does not literally infringe Claim 4 of the '194 patent. In support of this contention Honeywell makes three arguments: first, that in claiming that the APS 3200 did not literally infringe Claim 4, Sundstrand's expert asserted that elements 4(c) & 4(d) had to be performed simultaneously; second, that Sundstrand's expert conceded that the APS 3200 did in fact use a flow-related parameter, DELPQP; and third, that Sundstrand's expert claimed there was no literal infringement based upon an interpretation that was rejected by the court as a matter of law when it construed the claim. The court will address these arguments in turn, and then will turn to whether there was substantial evidence presented at trial to support the jury's verdict.

The court finds Honeywell's argument that Sundstrand's evidence was legally insufficient to support a conclusion of non-infringement to be unpersuasive. Even considering that Shinskey said at one point that, "I believe that claim C and claim D must both apply at the same time,"[3] Tr. 1407-08, this does not render Sundstrand's entire case legally insufficient. Although Shinskey may have made this statement, it is clear that his opinion as to why the APS 3200 did not literally infringe each element of Claim 4 of the '194 patent did not depend on this statement. *But see LNP Eng'g Plastics*, 77 F.Supp.2d at 549 (holding that a patentee was entitled to JMOL where the thrust of the defendant's non-infringement argument was that it did not infringe the patents at issue because it was practicing the prior art). Specifically, before making this statement, Shinskey explained in detail why the APS 3200 did not infringe each individual element of Claim 4(c) & (d). Moreover, it is not disputed that the court properly instructed the jury that a finding of infringement did not depend upon simultaneous performance of the elements of the patents.

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3 Sundstrand characterizes this statement as a "nonresponsive answer to a question that he apparently misheard." *See* D.I. 280 at 18. Whether Shinskey heard the question, or made a misstatement is irrelevant because the statement simply goes to the credibility of Shinskey's testimony. In deciding a motion for JMOL, the court cannot assess the credibility of witnesses. *See Lucas Aerospace, Ltd. v. Unison Indus., L.P.*, 899 F.Supp. 1268, 1272 (D. Del. 1995).

As to Honeywell's second argument, that no reasonable jury could have concluded that the APS 3200 did not use a flow related parameter, the court finds that there is substantial evidence in the record from which the jury could conclude that the use of DELPQP did not literally infringe the patent. The thrust of Honeywell's argument is that they are entitled to judgment as a matter of law because Sundstrand's experts conceded that DELPQP is a flow-related parameter. Although Sundstrand's witnesses did at times indicate that flow is a component of the Static Pressure Parameter, *see e.g.*, Tr. 1581-82, there is also evidence in the record where Sundstrand's witnesses opined that DELPQP cannot be considered a flow-related parameter, *see e.g.*, Tr. 1356-1358. Based on the evidence presented at trial, the jury could have reasonably determined that the APS 3200's use of DELPQP did not literally infringe the patents.

Honeywell also argues that it is entitled to judgment as a matter of law because Sundstrand relied upon claim construction language that the court rejected. In particular, Honeywell contends that Shinskey's non-infringement testimony improperly imported the limitation of the "set point" into element 4(d), despite the court's interpretation to the contrary.[4] The court also finds this argument

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[4] The court has the power and obligation to construe as a matter of law the meaning of language used in a patent claim. *Se Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). In keeping with this

(Continued...)

to be unpersuasive. As the court has already explained, although Shinskey when speaking specifically about Claim 4(d), did use the term "set point," *see* Tr. 1400,[5] Sundstrand's non-infringement contentions did not rely upon this claim interpretation.

Finally, in light of the evidence presented at trial, the court finds that there was substantial evidence from which a reasonable jury could conclude that the APS 3200 did not literally infringe elements 4(c) & 4(d) of the '194 patent. Sundstrand presented substantial evidence, through its expert, Shinskey, which explained that because the parameter used in the APS 3200, DELPQP, was "really a composite measurement, [which] includes compression ratio along with flow," Tr. 1357, it did not literally infringe the flow-related parameter described in Claim 4(c) of the '194 patent. Regarding Claim 4(d), Sundstrand also brought forth evidence that the APS 3200 did not literally use IGV positioned in the same way as the patent. *See* Tr. 1401. Based on this evidence, the court concludes that there was substantial evidence to support the jury's verdict. Therefore, Honeywell's motion for

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duty, the court issued an Order on Claim Construction on February 14, 2001. D.I. 252.

5 Shinskey stated that "The function that is performed in the patent is to take the IGV position and adjust the set point of the controller . . . ." Tr. at 1400.

judgment as a matter of law on the issue of literal infringement of Claim 4 of the '194 patent is denied.

2. Whether Honeywell is Entitled To Judgment As a Matter of Law on Damages?

In a footnote, Honeywell also argues that the court should enter judgment as a matter of law that Honeywell is entitled to price erosion damages of over $71 million, rather than the $45 million awarded by the jury, and that the appropriate reasonable royalty rate is 12 percent rather than the 7.5 percent awarded by the jury's verdict. The sole basis for this motion seems to be that Honeywell put forth substantial evidence on damages and that Sundstrand allegedly did not present meaningful evidence in response. Sundstrand characterizes this JMOL motion on damages as "half-hearted" and argues that Honeywell asks the court to re-weigh the evidence and overturn the jury's verdict. The court agrees. At trial, Sundstrand adduced evidence from which a jury could reasonably conclude that Honeywell's price erosion claims were overstated and that its royalty rate was unreasonably high. Based on the evidence presented at trial, the court concludes that there was substantial evidence from which a reasonable jury could conclude that Honeywell was entitled to $45 million in price erosion damages and a reasonable royalty rate of 7.5

percent.[6] Therefore, Honeywell's motion for judgment as a matter of law on damages is denied.

B. Hamilton Sundstrand's Motion for Judgment as a Matter of Law On Liability

1. Whether Sundstrand is Entitled to Judgment as a Matter of Law, or Alternatively, to a New Trial, on Infringement Under the Doctrine of Equivalents?

In its motion, Sundstrand argues that it is entitled to judgment as a matter of law because there was no legally sufficient basis for the jury to have found that the APS 3200 infringes either of the patents-in-suit under the doctrine of equivalents. In support of its motion, Sundstrand first argues that the jury's verdict cannot stand because Honeywell's equivalence argument impermissibly disregards the content of the patents' claim language. In addition, Sundstrand argues that it is entitled to judgment as a matter of law because Honeywell failed to support its equivalence claim with particularized testimony.

A device that does not literally infringe a claim may nonetheless infringe "if there is equivalence between those elements of the accused product and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis*

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6 *See also* discussion *infra* Section III.C.2. (addressing Sundstrand's Motion for Judgment as a Matter of Law on damages).

Chem. Co., 520 U.S. 17, 21, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). Infringement under the doctrine of equivalents must be established on a limitation-by-limitation basis. *Id.* at 29, 117 S.Ct. 1040 ("doctrine of equivalents must be applied to the individual elements of the claim, not to the invention as a whole"). Moreover, the court is mindful that it must take a "special vigilance against allowing the concept of equivalence to eliminate completely" the individual elements of the patented invention. *Id.* at 40, 177 S.Ct. 1040.

An element of an accused device is equivalent to an element of the patented invention if the differences between them are insubstantial. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. at 39, 117 S.Ct. 1040; *Zelinski v. Brunswick Corp.*, 185 F.3d 1311, 1316-17 (Fed. Cir. 1999); *Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d 1009, 1014 (Fed. Cir. 1998). Alternatively, the accused product infringes under the doctrine of equivalents if the element in the accused device performs substantially the same function in substantially the same way to obtain the same result as the claim limitation. *See Warner-Jenkinson*; 520 U.S. at 39, 117 S.Ct. 1040; *Zelinski v. Brunswick Corp.*, 185 F.3d at 1316-17; *Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d at 1016. Whether the former, the "insubstantial differences" test, or the latter, the "triple identity" test is applied, the essential inquiry remains the same: "Does the accused product or process contain elements identical or equivalent to each claimed element of the patented invention?" *Warner-Jenkinson*, 520 U.S. at 40, 117 S.Ct. 1040.

A determination of infringement under the doctrine of equivalence is a factual matter normally reserved for a fact finder. *Sage Products, Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423 (Fed. Cir. 1997). Although infringement under the doctrine of equivalents is generally considered a question of fact, that does not in and of itself preclude directing judgment in favor of the accused infringer. There is a triable issue of fact only if the evidence is such that a reasonable jury could resolve the question in favor of the patentee. *Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d at 1017 (reversing district court and granting judgment for defendant where devices were not substantially the same) (citing *Warner-Jenkinson*, 520 U.S. at 39 n.8, 177 S.Ct. 1040)). Finally, just as with literal infringement, the patentee must prove by a preponderance of the evidence that each element of the patent, or its substantial equivalent, exists in the accused device. *See Lemelson v. United States*, 752 F.2d 1538, 1551 (Fed. Cir. 1985).

With this legal background in mind, the court now considers the issues presented by the parties: whether Honeywell's infringement contentions ignored the limitations of the '893 and '194 patents and, therefore, impermissibly expanded the scope of the claims, and whether Honeywell has satisfied specific evidentiary requirements. The court will address these issues in turn.

a. Whether the Jury's Finding of Equivalence is Precluded as a Matter of Law?

In *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, the Supreme Court urged district courts, in appropriate circumstances to give serious consideration to directing judgment (e.g., in response to a motion for summary judgment or JMOL) on the issue of equivalence under the doctrine of equivalents, and in fact stated that district courts "are obliged" to do so "[w]here the evidence is such that no reasonable jury could determine two elements to be equivalent." 520 U.S. 17, 39 n. 8, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). Thus, if Honeywell's theory of equivalence would vitiate a claim, there can be no infringement under the doctrine of equivalents as a matter of law. *See id.*

According to Sundstrand, the jury's finding of infringement under the doctrine of equivalents in this case is precisely the kind of result the Supreme Court and the Federal Circuit have urged district courts to guard against when patent cases are tried to juries. Sundstrand claims that it is entitled to judgment as a matter of law because the jury's finding of equivalence in this case depends on disregarding the specific terms of what the patent claims require and how the accused product works. Thus, Sundstrand is not merely challenging the evidentiary or factual sufficiency of the evidence, but rather, claiming as a matter of law that the APS 3200 falls outside of scope of equivalents and, therefore, a finding of equivalence is not even a permissible option.

Sundstrand alleges that at trial, Honeywell's equivalence arguments completely ignored the content of the claim limitation that specified a particular role for inlet guide vane position in controlling surge. Specifically, Sundstrand charges that Honeywell reduced the comparison of the APS 3200 and the patented claims "to the gross simplification that inlet guide vane position 'is used in the operation of the surge control system.'" D.I. 275 at 11. The sole basis for Sundstrand's argument seems to be that "[t]he differences between the Honeywell patents and the APS 3200 are real and substantial. The surge control system claimed by the patents adjusts the flow rate to be maintained based on the position of the inlet guide vanes. The APS 3200 makes this adjustment based on air temperature instead. This is undisputed." D.I. 275 at 3.

At the outset, the court must emphasize that whether the APS 3200 uses temperature alone to adjust the flow rate is without doubt, in dispute. A quick review of the case docket clearly belies any contention that it is undisputed that the APS 3200 uses only air temperature to adjust the flow rate. In January of 2001, the court denied Sundstrand's motion for summary judgment concerning infringement because there were genuine issues of material fact that prevented the court from ruling as a matter of law. *See* D.I. 185. At the summary judgment stage of this action, the parties clearly disputed whether the use of temperature in the APS 3200 was an additional input to the use of IGV position, or if it was a substitute for IGV position. In light of this dispute, the parties proceeded to trial.

At trial, both parties presented competent evidence in the form of expert testimony that supported their respective positions. Ultimately, the jury determined that Honeywell had proved by a preponderance of the evidence that the use of temperature in the APS 3200 was not a substitute for, but rather, an addition to, the use of IGV position input to control surge that is claimed in the patents.

The court is not unwilling to fulfill its duties with "special vigilance" as directed by the Supreme Court in *Warner-Jenkinson* by guarding against findings of equivalence that ignore the specifics of what the patent claims require. The court also cannot forget, however, its mandate in deciding a JMOL motion--that it may not substitute its own judgment for the jury's opinion where the jury's verdict is based on substantial evidence. *See Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d at 1269. Upon review of the trial record, the court finds that Honeywell's doctrine of equivalents contentions did not consist merely of the oversimplification that inlet guide vane position is used in the APS 3200. Rather, in making its equivalence contentions, Honeywell set forth competent evidence from which a jury could reasonably conclude that the way the APS 3200 uses inlet guide vane position is insubstantially different from the way inlet guide vane position is used in the patent claims.

For example, Honeywell introduced evidence at trial from which a jury could conclude that the flow-related parameter used by the APS 3200, DELPQP, was a direct function of inlet guide vane

position.[7] In particular, Honeywell's expert, Muller, when questioned on cross-examination in response to the question stated:

> "Well, the calculation of DELPQP is a measurement of two static pressures?" Tr. 708.
>
> It would appear that way. But in a rigorous way, I think that we have to look at this and say when you say DELPQP has no relationship to IGV position, well, as I've been discussing throughout the day, it in fact does in a strong one in fact. In fact, it's part and parcel of how the entire compressor is equaled. DELPQP is a value, basically the result of a division process that has occurred resulting from the change in pressure divided by the pressure at the discharge of the compressor. The division which generates this value, which we call DELPQP, well, the change in pressure and the discharge pressure as, especially the change in

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[7] Muller further explained that the surge set point used in the APS 3200, which Sundstrand maintains is a function only of temperature, is also affected by flow, which Muller maintains is a function on inlet guide vane position. Tr. at 735-737 (explaining that the surge set point is "obtained from this flow curve, from this flow curve which is generated as we vary the IGV angles from minimum to max").

> pressure, is a result of change in flow. And as we know from the earlier description, the only way you can have a change in flow in the compressor is by changing the IGV, the position of the IGV valves. So in the IGV position-so following it through, as the IGV position changes, it changes the flow, which changes the value of pressure, divided by the pressure, which generates DELPQP which is a function of, in the end, the change in the IGV position.

Tr. at 709. Honeywell has also shown that it elicited admissions from Sundstrand's witnesses which also support this position. Specifically, Alan Gruebel, a Sundstrand engineer, admitted that in the APS 3200, "the position of the inlet guide vanes may affect the parameter Delta P over P." Tr. at 1742-43. In addition, Shinskey, Sundstrand's expert, also stated that in the APS 3200 IGV position "affects the flow and compression ratio at which surge would occur." Tr. at 1562. Shinskey described DELPQP as a composite parameter that is related to both flow and compression ratio. *See* Tr. at 1583. In light of this testimony, the court finds that Honeywell's equivalence arguments do not vitiate the claim terms. Therefore, they are not legally insufficient.

b. Whether Honeywell Supported Its Equivalence Claim With Particularized Testimony?

Sundstrand also maintains that it is entitled to judgment as a matter of law because Honeywell

failed to support its equivalence argument with particularized testimony and linking argument. Specifically, Sundstrand argues that Honeywell's function-way-result equivalence argument is overly broad and general. In addition, Sundstrand also asserts that Honeywell's counsel failed to provide a linking argument explaining why its evidence established equivalence in his summation on infringement. The court will address each of these arguments in turn.

Infringement under the doctrine of equivalents must be established with "particularized testimony and linking argument." *Lear Siegler, Inc. v. Sealy Mattress Co.*, 873 F.2d 1422, 1426 (Fed. Cir. 1989). Thus, "[g]eneralized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice." *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996); *Lucas Aerospace Ltd.*, 899 F. Supp. at 1280. The thrust of this requirement is to "ensure that a jury is provided with the proper evidentiary foundation from which it may permissibly conclude that a claim limitation has been met by an equivalent." *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1188 (Fed. Cir. 1998). In light of this requirement, the court finds helpful this court's reasoning in *Lucas Aerospace*, which stated that, "[i]n essence, *Lear Siegler, Inc. v. Sealy Mattress Co.* adds no substantive requirements to prove infringement, but 'merely requires that a patentee prove all elements of his case . . ., with respect to the doctrine of equivalents.'" *Lucas Aerospace Ltd.*, 899 F. Supp. at 1280 (quoting *Malta*

v. Schulmerich Carillons, Inc., 952 F.2d 1320, 1328 (Fed. Cir. 1991)). In other words,

> Pursuant to our precedent, a patentee must still provide particularized testimony and linking argument as to the "insubstantiality of the differences" between the claimed invention and the accused device or process, or with respect to the function, way, result test when such evidence is presented to support a finding of infringement under the doctrine of equivalents. Such evidence must be presented on a limitation-by-limitation basis. *Texas Instruments*, 90 F.3d at 1567.

The court must again emphasize that under the Supreme Court's decision in *Warner-Jenkinson*, infringement under the doctrine of equivalents may be established either through the triple identity test or through the insubstantial differences test; and, therefore, there is no "particular linguistic formula" required for an equivalents case. *Id.*, 520 U.S. at 40, 117 S. Ct. 1040. *See also CFMT Inc. v. Steag Microtech Inc.*, 14 F.Supp.2d 572, 591 (D.Del. 1998) ("the court does not believe that there should be a strict formula for evidence needed to support a case alleging infringement under the doctrine of equivalents."). Thus, the court must deny Sundstrand's motion for JMOL, if Honeywell presented particularized testimony in support of either a triple identity or insubstantial differences analysis.

Upon consideration of the trial record, the court finds that Honeywell supported its doctrine of equivalence infringement contentions with sufficiently particularized testimony under either test. First, the court finds that testimony about the equivalent function, way and result of the elements in the patents and the APS 3200 was more than sufficient to meet the standards set by *Lear Seigler*. *See, e.g.*, Tr. at 620-22, 633, 654, 693-94, 697-99, 701-02, 703, 705-07, 744, and 755 (comparing the function-way-result of the APS 3200 and Claim 4(d) of the '194 patent); Tr. at 620-22, 633, 654, 667-68, 669, 689, 690, 694, 700-01, 703, 729, 744, and 750-51 (comparing the same as to elements 8(f) and 19(g) of the '893 patents). Moreover, Honeywell's expert, Muller also provided particularized testimony in support of the argument that the related elements of the APS 3200 were insubstantially different than the single elements of each claim not present through literal infringement. *See* Tr. at 636-658 (describing how the APS 3200 infringes every claim of Claim 4 of the '194 patent); 660-672 (describing same as to claim 8 of the '893 patent); 674 (describing the same as to claim 10 of '893 patent); 675-676 (describing same as to claim 11 of '893 patent); 682-690 (describing same as to claim 19 of '893 patent); and 691-692 (describing same as to claim 23 of the '893 patent).

Thus, despite Sundstrand's argument to the contrary, the court finds that Honeywell did not merely present generalized testimony as to the overall similarity between the claims and the accused device. *See e.g., Texas Instruments*, 90 F.3d at 1567-68 (explaining that expert provided "merely

generalized testimony as to overall similarity" and there was "no discussion of whether or how the way" *part of the triple identity test* was met); *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d at 1327 (explaining that an expert's "offhand and conclusory statements . . . are not particularized evidence"). In addition, the court finds that Honeywell's equivalence arguments were not legally insufficient. *See e.g., CFMT, Inc. v. Steag Microtech, Inc.*, 14 F.Supp.2d at 591 (explaining that the plaintiff's expert did not "spend any time" specifically discussing the doctrine of equivalents, but instead, the plaintiff chose to focus its efforts on a theory of literal infringement); *LifeScan, Inc. v. Home Diagnostics, Inc.*, 103 F.Supp.2d at 361 (holding that the expert failed to explain how the defendant's device operated in an equivalent manner to one of the patent claims). Rather, the court finds that Honeywell presented substantial, sufficiently particularized testimony comparing the elements of the APS 3200 to the elements of the patents-in-suit.

Sundstrand also argues that Honeywell's counsel did not adequately discuss the doctrine of equivalents in his closing argument. Thus, Sundstrand contends that he failed to provide sufficient linking argument to explain why Honeywell's evidence established equivalence. Upon consideration of the record, *see* Tr. at 2548-57, the court finds that Honeywell's counsel sufficiently addressed the issue of infringement under the doctrine of equivalents such that it cannot be said that the jury was "put to sea without guiding charts." *Lear Siegler, Inc. v. Sealy Mattress Co.*, 873 F.2d at 1426; *CFMT Inc.*, 14 F.Supp.2d at 590.

Therefore, the court will deny Sundstrand's motion for judgment as a matter of law on the issue of infringement under the doctrine of equivalents because it finds that the jury's verdict was based on substantial evidence.

2. Whether Sundstrand is Entitled to a new Trial on the Issue of Infringement Under the Doctrine of Equivalents?

Sundstrand also argues that it is entitled to a new trial on infringement under the doctrine of equivalents for the same reasons it offered in support of its motion for judgment as a matter of law. In addition, Sundstrand argues that the court should grant its motion for a new trial because of the court's ruling on proposed jury instructions relating to equivalence and because of the court's claim construction of Claim 4(d) of the '194 patent.

As the court has explained in denying Sundstrand's motion for JMOL on the issue of infringement under the doctrine of equivalents, the jury's verdict was supported by substantial evidence. For these same reasons, the court does not find that the verdict was against the clear weight of the evidence.[8] In determining that the verdict was not against the clear weight of the evidence, the court

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8 The court is aware that a new trial may be granted even when judgment as a matter of law is inappropriate, that is, even if the verdict is supported by substantial evidence. *See Roebuck v. Drexel Univ.*, 852 F.2d 715, 735 (3d Cir. 1988).

finds that it is not "quite clear that the jury has reached a seriously erroneous result," *Lafate v. Chase Manhattan Bank*, 123 F.Supp.2d 773, 788 (D.Del. 2000), nor is the court left with the "firm conviction that a mistake has been committed" at trial. *See Railroad Dynamics v. A. Stucki Co.*, 727 F.2d 1506, 1512 (Fed. Cir. 1984). Therefore, the court will deny Sundstrand's motion for a new trial.

Second, as to Sundstrand's claim that it is entitled to a new trial because the court gave erroneous jury instructions, the court will again deny Sundstrand's motion. A new trial on the ground of erroneous instructions is permissible only when it is clear that an error in instructions as a whole was such as to have misled the jury. *See New Idea Farm Equip. Corp. v. Sperry Corp.*, 916 F.2d 1561, 1567 (Fed. Cir. 1990). Moreover, a new trial due to an alleged erroneous instruction may be given where the error is fundamental or may cause a miscarriage of justice. *See Wagner v. Fair Acres Geriatric Center*, 49 F.3d 1002, 1018 (3d Cir. 1995). In evaluating a motion for a new trial due to an alleged legal error in jury instructions, the court must determine (1) whether an error was in fact committed, and (2) whether the error was so prejudicial that denial of a new trial would be "inconsistent with substantial justice." *Lafate v. Chase Manhattan Bank*, 123 F.Supp.2d 773, 785 (D.Del. 2000). In doing so, the court should examine the jury instructions as a whole, not just specific provisions in isolation. *Id.*

In this case, the specific challenges that Sundstrand makes were considered and rejected by the court after hearing argument on the issue. *See*

Tr. at 2184-85 (considering Sundstrand's request to further amend the jury instructions). Upon review of the record, the court finds that Sundstrand has not demonstrated that the court's instructions were erroneous as a matter of law. Although Sundstrand claims that court in instructing the jury on equivalence, it has not demonstrated how the court's alleged errors in instructing the jury caused the jury to be misled or confused. For these reasons, the court will deny Sundstrand's motion for a new trial based on alleged erroneous equivalence instructions.

Finally, the court is also not persuaded that Sundstrand is entitled to a new trial because of the court's construction of Claim 4(d) of the '194 patent. Sundstrand relies on the arguments made in its claim construction briefs in support of its motion for a new trial. The court has already considered these arguments, and concludes that Sundstrand has failed to raise a valid basis for reconsideration of the issue. Therefore, the court will deny Sundstrand's motion for a new trial.[9]

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9 Sundstrand also argues that Honeywell's assertion of equivalence is barred by the Federal Circuit's decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558 (Fed. Cir. 2000) (en banc), *cert. granted*, 533 U.S. 915, 121 S. Ct. 2519, 150 L.Ed.2d 692 (2001). As both parties correctly point out, the court has already considered and rejected this argument on summary judgment, D.I. 187, and reconsideration, D.I. 223. Therefore, the court will not address this issue again.

3. Whether Sundstrand is Entitled to Judgment As a Matter of Law on Invalidity Under the On Sale Bar?

The jury found that the patented inventions were not on sale prior to the critical date of February 19, 1980. Sundstrand contends that evidence in the record demonstrates that Honeywell sold an APU incorporating the surge control logic covered by the patents-in-suit before the critical date. Thus, Sundstrand argues that it is entitled to judgment as a matter of law because the jury's verdict was not supported by substantial evidence.

Section 102(b) of the Patent Act prohibits granting a patent for an invention that was "on sale" in the U.S. more than one year before the patent application date. 35 U.S.C. § 102(b). The "critical date" in a Section 102(b) inquiry is defined as exactly one year before a patent application is filed. The on-sale bar applies when two conditions are satisfied before the critical date of one year before the filing date of the application: (1) a product embodying the claimed invention is the subject of a commercial offer for sale; and (2) the claimed invention is ready for patenting. *See Pfaff v. Wells Electronics, Inc.*, 525 U.S. 55, 67, 119 S. Ct. 304, 142 L.Ed.2d 261 (1998). A claimed invention is ready for patenting if it is reduced to practice or if there is "proof that prior to the critical date the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention." *Id.* Whether an invention was on sale more than one year before th patent's application date is a question of law for the

court to decide based on underlying factual determinations. *See Abbott Lab. v. Geneva Pharm., Inc.*, 182 F.3d 1315, 1317 (Fed. Cir. 1999), *cert. denied*, 528 U.S. 1078, 120 S. Ct. 796, 145 L.Ed.2d 671 (2000); *Ferag AG v. Quipp Inc.*, 45 F.3d 1562, 1566 (Fed. Cir. 1995). The goal of Section 102(b) is to prevent inventors from exploiting the commercial value of an invention while deferring the beginning of the statutory period. *Ferag AG*, 45 F.3d at 1566. At trial, Sundstrand bore the burden of establishing that Honeywell had violated the on sale bar by clear and convincing evidence. *See Pfaff v. Wells*, 525 U.S. at 66-67.

Sundstrand argues that it is entitled to judgment as a matter of law because Honeywell signed contracts with both Boeing and Airbus to sell an APU known as the 331 APU in 1978 before the critical date. Upon consideration of the trial record, the court finds that judgment as a matter of law is not warranted. Honeywell presented substantial evidence from which a reasonable jury could conclude that the products offered for sale in the Boeing and Airbus contracts were not products which embodied the subject matter claimed in the '194 and '893 patents. In particular, Honeywell offered evidence that the contracts cited by Sundstrand did not contain sufficiently specific reference to Honeywell's patented surge control inventions. *See* Defendant's Trial Exhibit ("DTX") 37 and 168. Honeywell also presented evidence that three pre-critical date drawings identified by Sundstrand did not themselves constitute commercial offers for sale, *See* DTX 37, 38 and 39.

Honeywell also presented evidence at trial from which a reasonable jury could conclude that the patented inventions were not ready for patenting prior to the critical date. Honeywell presented evidence that the documents at issue were not sufficiently specific to enable one of ordinary skill to practice the Honeywell inventions. *See* Tr. at 2313-19 and 1795. *See also e.g.*, Tr. at 1781-82 (Inventor Stokes describing DTX 38, "I wouldn't call [the document at issue] a final configuration"); Tr. at 1536 (Sundstrand's expert Shinskey discussing DTX 38: "a final configuration as described here, that doesn't mean that the job is done and that this product will work when it's in the field"). In addition, Honeywell presented evidence that the patented surge control systems were still undergoing development after February 19, 1980. Thus, the inventions could not have been ready for patenting prior to the critical date. *See e.g.*, Plaintiff's Trial Exhibit ("PTX") 35, 39 and 40.

In light of the evidence presented at trial, the jury could have reasonably concluded that Sundstrand did not establish that Honeywell violated the on sale bar by clear and convincing evidence. Moreover, considering that Sundstrand had the burden of proving its case by clear and convincing evidence, the court cannot conclude that Sundstrand established that Honeywell violated the on sale bar by evidence that the jury would not be at liberty to disbelieve, nor can the court conclude that the only reasonable conclusion would be in Sundstrand's favor. *See LNP Eng'g Plastics*, 77 F.Supp.2d at 547. Therefore, the court will deny

Sundstrand's motion for judgment as a matter of law on this issue.

4. Whether Sundstrand is Entitled to Judgment as a Matter of Law on Invalidity Because the Patents Were Anticipated and Obvious?

The jury found that the patents-in-suit were valid over the prior art. Sundstrand argues that it is entitled to judgment as a matter of law because prior art references and the testimony of its expert, Mr. Shinskey, establish prior art references anticipated and rendered obvious the '893 and '194 patents. Sundstrand identified these prior art references at trial as Warnock (1976), DTX 147, Kempe (1963), DTX 5, White (1972), DTX 6 and the reprint of Fallin (1968), DTX 19 in Shinskey (1978), DTX 146. *See* Tr. at 1425-1527. The court will address the issues of invalidity due to anticipation and obviousness separately.

a. Anticipation

A claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference. *Celeritas Techs., Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1106, 119 S. Ct. 874, 142 L.Ed.2d 774 (1999). Accordingly, invalidity by anticipation requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue

experimentation. *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). The prior art need not state the elements of the claim in identical language. *See Procter & Gamble Co. v. Nabisco Brands, Inc.*, 711 F. Supp. 759, 762 (D. Del. 1989). Anticipation is a question of fact. *See In re Graves*, 69 F.3d 1147, 1151 (Fed. Cir. 1995). The defendant bears the burden of proving invalidity due to anticipation by clear and convincing evidence. *See Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000).

At trial, Honeywell introduced evidence that none of the four prior art references advanced by Sundstrand disclosed each element of the challenged claims such that one skilled in the art could practice the invention. For example, Honeywell offered evidence that none of the prior art references made reference to APUs or to any application to the aerospace industry. *See* Tr. at 1612-23, 1617, 1660-61, 1664-65. In addition, Honeywell cross-examined the defendant's expert, Shinskey as to each of the four references and elicited testimony from which a reasonable jury could conclude that the patents were not anticipated by the prior art. Finally, Honeywell presented evidence that none of the prior art references advanced by Sundstrand addressed the "unique ability for the load compressor to operate under a continuous minimum flow condition regardless of the surge bleed valve's position." Tr. at 2293-94. In light of the evidence presented at trial, a reasonable jury could conclude that Sundstrand

failed to demonstrate by clear and convincing evidence that any of the prior art references it advanced anticipated the patents-in-suit.[10]

b. Obviousness

Section 103 prohibits the granting of a patent "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). The ultimate determination of whether an invention would have been obvious under 35 U.S.C. § 103(a) is a legal conclusion based on underlying findings of fact. *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000). To determine the question of obviousness, the court should look to: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the art; and

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10 Sundstrand also argues that it is entitled to judgment as a matter of law because Honeywell's defense to anticipation (and obviousness) relied upon improper claim construction. The court is not persuaded by this argument. First, as Honeywell correctly points out, assuming that Honeywell did rely upon improper claim construction, Sundstrand did not properly raise the issue at trial by objecting to Mr. Muller's supposed claim construction. Second, the court finds that Mr. Muller did not engage in claim construction, but instead, that he explained why the prior art references disclosed a surge control system that met the limitation at issue.

(4) objective evidence of nonobviousness. *Riverwood Int'l Corp. v. The Mead Corp.*, 212 F.3d 1365, 1366 (Fed. Cir. 2000) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17, 86 S. Ct. 684, 15 L.Ed.2d 545 (1966). "Such secondary considerations as commercial success, long felt but unsolved needs, [and] failure of others" [to invent] are also relevant to the obviousness inquiry. *Ryko Manu. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991).

Obviousness may not be established using hindsight. *See Kahn v. General Motors Corp.*, 135 F.3d 1472, 1479 (Fed. Cir. 1998). In determining obviousness, the invention must be considered as a whole and the claims must be considered in their entirety. *Id.* at 1479-80. Moreover, when obviousness is based on a combination of two or more particular prior art references, there must be a showing of a suggestion or motivation to combine the teachings of those references, though it need not be expressly stated. *Riverwood* at 1366.

At trial, Honeywell presented evidence that no combination of the prior art references upon which Sundstrand relied rendered the patents-in-suit obvious because they did not discuss a surge control system that maintained an essentially constant minimum flow rate. *See e.g.*, Tr. at 2311-12. In addition, Honeywell presented evidence of secondary considerations that would support a jury verdict of nonobviousness. *See e.g.*, Tr. at 910, 970-71, 1223-35, and 1303-04 (relating to commercial success of the patented invention).

Upon consideration of the evidence presented at trial, the court finds that the jury's finding that the patents-in-suit were valid and were neither anticipated nor rendered obvious by prior art to be supported by substantial evidence. Therefore, the court will deny the defendant's motion for judgment as a matter of law on the issue of validity.

C. Hamilton Sundstrand's Motion for Judgment as a Matter of Law as to Issues Pertaining to Damages and Willfulness

1. Whether Sundstrand is Entitled to Judgment as a Matter of Law Limiting the Damages Award to $150,000 Due to the Availability of a Non-Infringing Alternative?

Sundstrand next argues that it is entitled to judgment as a matter of law limiting Honeywell's damages to $150,000 because a non-infringing alternative was available during the infringement period. Thus, Sundstrand contends that the jury's damages award was not based on substantial evidence.

Sundstrand maintains that the availability of an acceptable non-infringing alternative would preclude Honeywell from recovering price erosion damages. In order to be an acceptable non-infringing alternative, the substitute product must have the advantages of the patented product. *C.R. Bard, Inc. v. Boston Scientific Corp.*, 250 F.3d 761, 2000 WL 915241, at *3 (Fed. Cir. July 7, 2000) (unpublished) (citing *Stryker Corp. v. Intermedics Orthopedics, Inc.*, 96 F.3d 1409, 1418 (Fed. Cir. 1996)). Moreover, to be

an acceptable non-infringing substitute, the product or process must have been available or on the market. *Grain Processing Corp. v. American Maize Prods. Co.*, 108 F.3d 1392, 1997 WL 71726, at *2 (Fed. Cir. 1997) (unpublished). In this case, there is no dispute that the alleged non-infringing design was not on the market. The parties are in dispute, however, as to whether an acceptable non-infringing alternative was available.[11]

A non-infringing alternative is only available during the accounting period if the infringer had all of the necessary equipment, know-how, and experience to [use the alternative] whether it chose to do so during the time of infringement. *See Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1354 (Fed. Cir. 1999). "When an alleged alternative is not on the market during the accounting period, a trial court may reasonably infer that it was not available as a non-infringing substitute at that time." *Id.* at 1353. Also, the mere fact of switching to a non-infringing product years

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11 The critical time period for determining availability of an alternative is the period of infringement for which the patent owner claims damages; this period is known as the "accounting period." *Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1353 (Fed. Cir. 1999). According to Sundstrand, the existence of a non-infringing alternative prior to February 3, 1999 would preclude Honeywell from recovering price erosion damages, and the existence of a non-infringing alternative prior to May of 1993 would cap Honeywell's ability to recover reasonable royalty damages.

after the period of infringement does not establish the presence of a non-infringing substitute during the period of infringement. *See id.* 185 F.3d at 1348 and 1353.

The accused infringer has the burden to overcome the inference raised when a substitute design is not on the market by showing that the substitute was available during the accounting period. *See id.* at 1353. "Mere speculation or conclusory assertions will not suffice to overcome the inference." *Id.* As the Federal Circuit Court of Appeals explained in *Grain Processing v. American Maize-Products*:

> After all, the infringer chose to produce the infringing, rather than non-infringing, product. Thus, the trial court must proceed with caution in assessing proof of the availability of substitutes not actually sold during the period of infringement. Acceptable substitutes that the infringer proves were available during the accounting period can preclude or limit lost profits; substitutes only theoretically possible will not.

Id. Finally, the court notes that the existence of a non-infringing substitute is a question of fact. *See Grain Processing Corp.*, 185 F.3d at 1352; *Minnesota Mining and Manufacturing Co. v. Johnson & Johnson Orthopeadics*, 976 F.2d 1559, 1577 (Fed. Cir. 1992).

In support of its claim that a non-infringing alternative was available, Sundstrand offered the testimony of Sundstrand engineer, John Szillat. Szillat testified that in the fall of 2000, he conducted tests confirming that the high flow/low flow logic was not necessary under actual flight conditions. *See* Tr. at 1880-81, 1882-83, 1888-91, DTX 1485. Thus, Szillat explained that Sundstrand had modified the software code for the control logic of the APS 3200 to eliminate the high flow/low flow logic that Honeywell argues infringes its patents. Szillat further testified that he believed that Sundstrand could have made this modification in 1993. *See id.* at 1883. Szillat also admitted that in September of 2000, he was asked by trial counsel to look at the question of potential alternatives to the current high flow logic that was being used in the APS 3200. *See* Tr. at 1880.

In further support of its claim that a non-infringing alternative was available, Sundstrand also offered evidence of the substitute design's implementation by pointing to an Airbus test flight of the substitute design and the fact that Federal Aviation Administration (FAA) approval was imminent, with actual implementation set to occur in April or May of 2001. Finally, Sundstrand offered evidence that this substitute design would have been an acceptable alternative. *See* Tr. 1890-1891.

In response to Sundstrand's claim that a non-infringing alternative existed, Honeywell argued that Sundstrand was not capable of implementing the alternative design in 1993, or at any time prior to the expiration of the accounting period. Honeywell

presented evidence that the putative non-infringing alternative was not available because it had not been finalized, approved, or implemented. *See* Tr. at 1902-03. For example, Honeywell attempted to demonstrate that an alternative design was not available by calling into question Airbus' supposed acceptance of the alternative design. *See* Tr. at 1924. In further support of its argument that the alternative design was not available, Honeywell offered evidence that Sundstrand had attempted to address a problem identified as the "double solution" problem up through the year 2000. *See* PTX 916; Tr. at 1962-63. According to Honeywell, the infringing high flow/low flow inlet guide vane test had been included in the APS 3200's surge control logic in order to solve this "double-solution" characteristic of DELPQP. *See* Tr. at 1930.

In light of this evidence, the court finds that a reasonable jury could find that Honeywell offered testimony which would demonstrate that the alternative design was still in development and, thus, not available. Technology which is still in development during the accounting period is not considered to be an available alternative. *See e.g.*, *Kaufman Co. v. Lantech, Inc.*, 926 F.2d 1136, 1142 (Fed. Cir. 1991) (explaining that an alleged substitute that was "immature and more expensive than the patented technology during the time of infringement cannot have been an acceptable non-infringing substitute"); *Cf. Minnesota Mining*, at 976 F.2d at 1578 (affirming lower court finding that difficulty in developing a non-infringing alternative, which was admittedly done for the purposes of

litigation, was evidence that a non-infringing substitute was not available).

The jury also could have reasonably determined that a non-infringing alternative was not available because Honeywell challenged the credibility of Sundstrand engineer, John Szillat. In his testimony, Szillat conceded that he did not work at the company until 1998, and the he "really [did not] know what was done prior to when [he] worked on the 3200 as far as what alternatives had been considered." Tr. at 1921. In light of this admission, a jury could reasonably conclude that Sundstrand had failed to establish that it had the capability to produce a non-infringing alternative and that Szillat's claim was speculative at best. *Cf. Minco Inc. v. Combustion Eng'g, Inc.*, 95 F.3d 1109, 1119 (Fed. Cir. 1996) (explaining that "testimony that an infringer might have been able to design around a patent does not, in itself, defeat a claim for lost profits"). In addition, Honeywell challenged whether the alternative design was available as early as 1993 by demonstrating that the search for a non-infringing alternative was motivated in part by the suggestions of a trial attorney late in the year of 2000. *See* Tr. at 1968-69. *But see Grain Processing*, 185 F.3d at 1354 (affirming district court finding that a non-infringing alternative was available, because the evidence demonstrated that the defendant did not have to 'invent around' the patent,

but rather, all it had to do was switch to using the available non-infringing alternative).[12]

2. Whether Sundstrand is Entitled to Judgment as a Matter of Law, or in the Alternative, a New Trial, On the Issue of Price Erosion Damages?

Sundstrand next argues that it is entitled to judgment as a matter of law on damages because the evidence offered by Honeywell in support of its price erosion claim was legally insufficient. Sundstrand also argues that it is entitled to a new trial on the issue of price erosion damages. The court will address these arguments separately.

a. Judgment as a Matter of Law

The Patent Act provides for "damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the invention by the infringer." *Minco Inc.*, 95 F.3d at 1118 (citing 35 U.S.C. § 284). Adequate damages can include lost profits due to diverted sales, price erosion, and increased expenditures caused by infringement. *Id.* (citing *Lam, Inc. v*

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12 In the alternative, Sundstrand argues that it is entitled to a new trial because the jury's verdict was against the clear weight of the evidence. In light of the trial record described above, the court is not persuaded by this argument. Therefore, the court will also deny Sundstrand's motion for a new trial.

Johns-Manville Corp., 718 F.2d 1056, 1065 (Fed. Cir. 1983)). Lost profits as a result of price erosion are compensable damages that stand on the same ground as damages caused by lost sales. *Micro Motion, Inc. v. Exac Corp.*, 761 F.Supp. 1420, 1430 (N.D. Cal. 1991) (citing *Lam*, 718 F.2d at 1065). In most price erosion cases, a patent owner has reduced the actual price of its patented product in response to an infringer's compensation. *Id.* (citing *Yale Lock Mfg. Co. v. Sargent*, 117 U.S. 536, 553, 6 S. Ct. 934, 29 L.Ed. 954 (1886)). A price erosion claim can also be sustained by a patent holder who proves that he would have increased his prices had the infringer not been in competition with him. *See id.* (citing *Kalman v. Berlyn Corp.*, 914 F.2d 1473, 1485 (Fed. Cir. 1990); *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 902 (Fed. Cir. 1986)).

In order to show "but for" causation and entitlement to lost profits, a patentee must reconstruct the market to show, hypothetically, "likely outcomes with infringement factored out of the economic picture." *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1355 (Fed. Cir. 2001) (citing *Grain Processing Corp. v. American*). *Maize-Prods.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999). Such market reconstruction, although hypothetical, requires "sound economic proof of the nature of the market." *Id.* Although damages may not be based on speculation, they need not be proved with unerring precision either. *See Minnesota Mining*, 976 F.2d at 1579 (citations omitted). In proving damages, the patentee may use a wide variety of reconstruction theories where the patentee has presented reliable economic evidence of

"but for" causation. *See Crystal Semiconductor*, 246 F.3d at 1355. With these principles in mind, the court turns to whether the jury's damages award was supported by substantial evidence.

In its motion for judgment as a matter of law, Sundstrand maintains that the evidence offered by Honeywell in support of its claim for price erosion damages was too speculative, and thus, the jury's price erosion award should be reversed. Sundstrand claims that the evidence presented at trial was legally insufficient because first, Honeywell relied on the faulty premise that absent competition from Sundstrand, it would have enjoyed a sole source position in the market; second, the testimony of Gregory Albert, Honeywell's product line director, cannot support its price erosion claims because his statements were conclusory and constituted unsupported lay opinion; and third, Honeywell's damages expert, Julie Davis, assumed that price erosion occurred, but did not offer any market study or other evidence from which the jury could reasonably determine the level of pricing that Honeywell would have applied absent competition from Sundstrand.

First, the court recognizes that in a two-supplier market, it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that the patent owner would have made the infringer's sales absent infringing competition. *See State Indus. Inc. v. Mor-Flo Indus. Inc.*, 883 F.2d 1573, 1578 (Fed. Cir. 1989). Thus, a patent owner's initial burden can be met by showing the existence of a two-supplier market. *See Polymer*

Indus. Prod. Co. v. Bridgestone/Firestone, Inc., Nos. 00-1271, 00-1299, 2001 WL 253259, at *5 (Fed. Cir. Mar. 13, 2001) (citing *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 926 F.2d 1161, 1165 (Fed. Cir. 1991)). At trial, Honeywell presented evidence that it operates in a two supplier market. *See* Tr. at 427, 852, 1154. In addition, two of Sundstrand's witnesses also gave testimony indicating that Honeywell and Sundstrand operate in a two-supplier market. *See e.g.*, Tr. at 1310-11. In particular, Sundstrand's expert on damages, Dennis Staats, in describing the APU market admitted that "To some extent it is a two supplier market. And I agree on the concept of [a] two supplier market for a certain piece of it." Tr. at 2015. In light of the record, the court finds that the jury could have reasonably concluded that Honeywell operates in a two-supplier market.[13]

Second, Sundstrand argues that the testimony of Gregory Albert, Honeywell's product line director,

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[13] At the close of evidence, the court gave the jury the following instruction which was agreed upon by the parties prior to trial:

> If you conclude that Hamilton Sundstrand and Honeywell are the only two suppliers in the market for the products in question, you may reasonably infer that any amount of lowered prices that Honeywell has shown was caused by Hamilton Sundstrand's sales of its APUs and services. However, this inference can be rebutted by other evidence in the record concerning Honeywell's prices. Tr. at 2461

was too speculative. At trial, Honeywell offered testimony from both a fact witness, Albert, and an expert witness, Davis, who testified that economic concessions granted to 14 airline customers were caused by Sundstrand's infringing competition. In claiming that the Honeywell made price concessions due to infringing competition, Albert identified fourteen contracts and testified that "[i]n every one of these 14 cases, we have made concessions, economic concessions, to those customers as a result of the competition with Hamilton Sundstrand." Tr. at 875. Honeywell also offered testimony of its Aerospace President, Steve Loranger, who testified that the APU market changed when Sundstrand entered into it in the early 1990s as "it became necessary to start significantly discounting the maintenance service costs . . . ." Tr. at 355-56. Although Sundstrand characterizes the evidence offered by Honeywell regarding price concessions as speculative, the court is not persuaded by this argument because Albert's testimony was based on his personal knowledge and experience. An award of damages for price erosion can be based on the testimony of a patent owner. *See Kalman v. Berlyn Corp.*, 914 F.2d at 1485 (citing *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 902 (Fed. Cir. 1986)); *Tenax Corp. v. Tensar Corp.*, Civ. No. G-89-424, 1991 WL 218508, at *9 (D. Md. Apr. 3, 1991) (explaining that a fact witness on damages could testify that prices were reduced due to infringer's competition, where witness testified upon his personal knowledge and involvement); *Micro Motion, Inc. v. Exac Corp.*, 761 F. Supp. at 1431 ("[t]he testimony at trial of Micro Motion managers responsible for its pricing decisions uniformly supports the proposition that

Micro Motion would have increased prices had Exac not been in the market."). Based upon the trial record, the court finds that Honeywell's evidence concerning price concessions was not too speculative. Thus, Honeywell's claim for price erosion damages were legally sufficient to support the jury's damages award.

Finally, Sundstrand challenges the testimony of Honeywell's damages expert, Julie Davis. First, Sundstrand charges Davis with solely relying on information from Gregory Albert, whose testimony the court has already explained was not too speculative to support an award for price erosion damages. Moreover, Davis testified that she did not rely solely on Albert, rather she stated that, "[e]ach of my footnotes describe exactly how I determined what the prices would have been and they don't necessarily rely on Mr. Albert's opinion." Tr. at 1180. Next, Sundstrand argues that Honeywell's claim for price erosion damages is legally insufficient because Davis allegedly failed to conduct a market study. At trial, Davis was asked on cross-examination about whether she conducted a market analysis consistent with the methods described in *Intellectual Property Infringement Damages, a Litigation Support Handbook*, by Russell Parr. Tr. at 1179 (referring to DTX 1672). In response, Davis stated that she did not follow the suggestions of Mr. Parr, but rather, she "chose to make a more detailed analysis of all the APUs involved in the case." Tr. at 1180. Considering that a patent owner has "significant latitude" in proving its damages, *Grain Processing*, 185 F.3d at 1350, the court finds that Davis was not required to conduct the type of market

analysis described by Parr. In this case, Honeywell presented ample evidence at trial describing Davis' methodology. *See* Tr. at 1096-1156. In light of this evidence, the jury could have reasonably concluded that Davis' methodology and testimony on damages were not faulty and were adequately supported.[14] *But see e.g., Crystal Semiconductor*, 246 F.3d at 1357-58 (affirming district court's denial of price erosion damages where the expert used a benchmark methodology that was unreliable because it compared two markets that were significantly different).

b. Motion for a New Trial

Sundstrand also moves for a new trial on the damages issue. Sundstrand argues that it should be granted a new trial because the verdict was against the clear weight of the evidence. Also, Sundstrand argues that it is entitled to a new trial due to the court's exclusion of testimony from its witness, Karl Johanson and the court's acceptance of Davis' expert opinion. Finally, Sundstrand claims that the court gave an erroneous instruction on whether the jury could consider Honeywell's sole source market position. The court will address these issues in turn.

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[14] The court also notes that the jury could have also reasonably doubted the credibility of Sundstrand's expert on damages, Mr. Staats. In fact, in his summation, Sundstrand's counsel admitted that Staats had in fact made an error in his analysis. *See* Tr. at 2634 (stating about Staats, "And he blew it in that one respect.").

First, the court finds that the jury's damages award was not against the clear weight of the evidence. As the court has already explained, both sides set forth competent evidence on the damages issue. Thus, the court sees no reason to substitute its own judgment of the credibility of the facts and witnesses for that of the jury. Therefore, the court will deny the defendant's motion for a new trial on the basis that the damages award was given against the clear weight of the evidence.

Next, the court will address Sundstrand's challenges to its evidentiary rulings concerning Johanson and Davis. Sundstrand suggests that a new trial is warranted due to the limitations the court placed on the testimony of Karl Johanson. Sundstrand proposed to offer Johanson's testimony for the proposition that Sundstrand also granted concessions to customers, even on "sole source" products. The court excluded Johanson's testimony pursuant to rule 26(e)(2) of the Federal Rules of Civil Procedure.[15] The court based its ruling on the following facts: (1) Honeywell had made a request

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[15] Fed.R.Civ.P. 26(e)(2) reads:

> A party is under a duty seasonably to amend a prior response to an interrogatory, request for production, or request for admission if the party learns that the response is in some material respect incomplete or incorrect and if the additional or corrective information has not otherwise been made known to the other parties during the discovery process or in writing.

for related documents in its first request for document production and Sundstrand did not comply because they did not believe the information was relevant, *see* Tr. at 1277; (2) Honeywell filed a 30(b)(6) notice and identified possible sole source information as a category in Topic 16,[16] *see* Tr. at 1279; (3) at the deposition of 30(b)(6) witness Johanson, Sundstrand limited the subject matter of Topic 16 to the APS 3200, *see* Tr. at 1279; (4) Sundstrand later determined the information was relevant,[17] *see* Tr. at 1282; and (5) even though Sundstrand determined that sole source market information was relevant, they failed to comply with any of Honeywell's earlier request for related documents.

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16 Topic describes:

> Any and all offers, proposals, and negotiations regarding the terms of any agreement regarding aftermarket sales, including but not limited to repairs, overhauls, replacements, replacement parts, spare parts and maintenance service agreements, whether or not the sale of the APU and/or the agreement regarding aftermarket sales was ultimately executed. Tr. at 1279.

17 Sundstrand asserts that this information became relevant when they first received information on Honeywell's damages methodology. The court notes that on cross-examination, Sundstrand took issue with Ms. Davis valuation methodology because she did not rely on sole source agreement. *See* Tr. at 1280.

Although the facts described above demonstrate that Sundstrand indeed did not seasonably amend its prior responses to discovery, Sundstrand maintains that the court erred because it had provided additional corrective information at Johanson's 30(b)(6) deposition. Sundstrand further argues that Honeywell should have moved to compel discovery of sole source information. Upon considerations of Sundstrand's motion for a new trial, the court finds that it did not err in excluding Johanson's testimony. Pursuant to Federal Rule of Civil Procedure 37(c),[18] the court determined that Sundstrand would not be allowed to use this information at trial because Honeywell was prejudiced by Sundstrand's failure to comply with rule 26(e)(2). Although Sundstrand disagrees with the court's ruling, the court was well within its discretion in excluding this information. *See Newman v. GHS Osteopathic, Inc.*, 60 F.3d 153, 156 (3d Cir. 1995). Moreover, errors in judicial rulings or in the conduct of the court warrant a new trial where the error or conduct was prejudicial. *See Medtronic Inc. v. Intermedics Inc.*, 799 F.2d 734, 740 (Fed. Cir.

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[18] Fed.R.Civ.P. 37(c) reads

> A party that without substantial justification fails to disclose information required by Rule 26(a) or 26(e)(1), or to amend a prior response to discovery as required by Rule 26(e)(2), is not, unless such failure is harmless, permitted to use as evidence at a trial, at a hearing, or on a motion any witness or information not so disclosed.

1986). Sundstrand posits that Johanson's testimony would have had a "profound impact on trial, particularly in view of Honeywell's position that it would not have granted any of the concessions it claimed 'but for" Hamilton Sundstrand's competition." D.I. 276 at 18 n.4. The court finds, however, that it is not clear that Johanson's testimony would have had a profound impact, especially in light Mr. Albert's testimony that Honeywell sometimes grants some concessions for other reasons. *See e.g.*, Tr. at 882-83 (describing launch concessions which are offered when a new aircraft is introduced in the marketplace). Thus, the court concludes that Sundstrand has also not demonstrated that the exclusion of Johanson's testimony was prejudicial.

Sundstrand also argues that the court erred in allowing Davis to testify because she was not qualified to testify as an expert under Federal Rule of Evidence 702 or 703. In particular, Sundstrand alleges that Davis has no specific expertise in the aerospace industry and that she relied solely on information provided to her by Mr. Albert. The court will deny Sundstrand's request for a new trial on this issue because the court did not err in admitting Davis as an expert. First, it is clear that Davis was qualified to testify as an expert in this case. Davis is the worldwide co-partner in charge of the international accounting firm of Arthur Andersen. She has been retained as many as 60 times as an expert on damages in intellectual property cases. *See* Tr. at 1093-1095. *But see Crystal Semiconductor*, 246 F.3d at 1355 (explaining that district court found that damages expert was not qualified because he

had minimal specialized academic credentials and minimal experience with patent damages). In addition, as the court has already explained, price erosion damages can be supported by the testimony of a patent owner. In light of this fact, the court found that Davis met with the requirements of Federal Rule of Evidence 703.[19]

Finally, Sundstrand argues that it is entitled to a new trial because Honeywell's counsel made a misrepresentation to the jury, and his misrepresentation was exacerbated by the court's erroneous instruction on this issue. The court granted Sundstrand's motion for summary judgment on the issue of Honeywell's failure to mark the '194 and '893 patents. This ruling precluded Honeywell from recovering damages for infringement alleged to

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19 FRE 703 reads:

> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence in order for the opinion or inference to be admitted. Facts or data that are otherwise inadmissible shall not be disclosed to the jury by the proponent of the opinion or inference unless the court determines that their probative value in assisting the jury to evaluate the expert's opinion substantially outweighs their prejudicial effect.

have occurred prior to February 3, 1999, the date of actual notice to Sundstrand. *See* D.I. 184. In his opening statement, Honeywell's counsel referred to the precluded damages. *See* Tr. at 198-199 ("We should be able to go back to May of 1993 to recover damages. But that's not the way it's going to work in this case . . . ."). Sundstrand objected and alerted the court that it intended to submit a curative amendment to the appropriate jury instruction. *See* Tr. at 244. Sundstrand then submitted a proposed revised jury instruction; on February 14, 2001, Honeywell agreed to Sundstrand's instruction.[20] Sundstrand alleges that Honeywell later misconstrued their proposed amendment to the instruction in an effort to confuse the jury. In other words, Sundstrand contends that the use that Honeywell subsequently made of the instruction differed from its intention in proposing the instruction. Sundstrand objected and then proposed

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20 The relevant instruction, Joint Instruction 5.3, initially read: "You are instructed that Honeywell may only recover for alleged acts of infringement that occurred on or after February 3, 1999." The agreed to curative Instruction 5.3 read: "You are instructed that Honeywell may only recover for alleged acts of infringement that occurred on or after February 3, 1999. There was some reference during the trial to rulings that I made before the trial began, setting February 3, 1999 as the starting date of any proof of damages. You are not to consider any possibility that Honeywell may have incurred damages prior to that date, and your finding of damages, if any, should not be influenced in any way by conjecture about Honeywell's prices or concessions in transactions that occurred prior to February 3, 1999."

another amended instruction. The court overruled Sundstrand's objections and rejected the second proposed revision to the instructions. *See* Tr. At 2185. The court subsequently charged the jury with the agreed upon curative instruction. *See* Tr. At 2459-60.[21]

As the court has already explained, a new trial on the ground of erroneous instruction is permissible only when it is clear that an error in the instructions as a whole was such as to have misled the jury. *See New Idea Farm Equip. Corp. v. Sperry Corp.*, 916 F.2d at 1567. As previously noted, in evaluating a motion for a new trial due to an alleged legal error in jury instructions, the court must determine (1) whether an error was in fact committed, and (2) whether the error was so prejudicial that denial of a new trial would be "inconsistent with substantial justice." *Lafate v. Chase Manhattan Bank*, 123 F.Supp.2d at 785.

The court finds that a new trial is not warranted in this case because Sundstrand has not demonstrated that the instruction the court read was erroneous or, even if it was, that it was prejudicial. The court read the curative instruction proposed by Sundstrand word for word. Moreover, a party who

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21 Sundstrand asserts that the court "subsequently charged the jury *without any curative text*." D.I. 286 at 21 (emphasis added). The court notes that this statement is inaccurate, as the court did read the agreed upon curative instruction.

requests an instruction cannot complain if the instruction, or one substantially like it, is given. *Tuttle v. Equifax Check*, 190 F.3d 9, 16 (2d Cir. 1999) (citations omitted). Therefore, the court will deny Sundstrand's motion for a new trial based on the charge that the court's jury instructions were erroneous.

3. Whether Sundstrand is Entitled to Judgment as a Matter of Law, or in the Alternative, a New Trial on Willfulness?

Sundstrand argues that it is entitled to judgment as a matter of law because the evidence is legally insufficient to support the jury's finding that Sundstrand willfully infringed. In the alternative, Sundstrand moves for a new trial on the issue of willfulness. The court will first address Sundstrand's motion for judgment as a matter of law, then it will turn to Sundstrand's motion for a new trial.

a. Judgment as a Matter of Law

Sundstrand argues that the court should overturn the jury's verdict because Honeywell's willfulness contentions were incorrect under the applicable law and because the evidence offered in support of Honeywell's willfulness contentions was insufficient as a matter of law.

First, Sundstrand argues that Honeywell "effectively reversed the analysis . . . on this point, arguing that all it needed to prove is that Hamilton Sundstrand employees knew that the Stokes patents

existed, and then Hamilton Sundstrand needed to prove that it had a reasonable basis for acting as it did in the fact of that knowledge . . . . This is not the law, nor should it be the law." D.I. 286, at 29. Thus, Sundstrand claims the jury's finding of willfulness in this case was inappropriate because the employees who worked with the APS 3200 were not aware of the patent, and those who had encountered the patent neither suspected infringement nor had any reason to do so. Sundstrand argues that to trigger the alleged infringer's duty to exercise due care in the face of knowledge about the patent, the patent owner must show that the accused infringer both knew about the patent and understood that the patent raised a potential infringement problem. In support of its argument, Sundstrand cites to *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 628 (Fed. Cir. 1985). However, the Federal Circuit in *Stryker Corp. v. Intermedics Orthopedics, Inc.*, clearly rejected any claim that actual notice requires both knowledge of the patents and knowledge of a problem of infringement. 96 F.3d 1409, 1415 (Fed. Cir. 1996). The accused infringer in *Stryker Corp.* also cited to *Shatterproof Glass* in arguing that in order to have actual notice, the infringer had to know of the patents and understand the potential related infringement problems. *See id.* In rejecting the accused infringer's arguments, the *Stryker* court described the argument as "flawed," and explained that the infringer's reliance on *Shatterproof Glass* was misplaced. *See id.* In light of *Stryker Corp.*, the court finds Sundstrand's claim that actual notice requires both knowledge of the patent and knowledge of the potential for infringement to be unpersuasive.

Second, Sundstrand contends that the jury's finding of willful infringement was not supported by substantial evidence. Sundstrand argues that Honeywell based its willfulness contentions on evidence that certain Sundstrand engineers and lawyers were made aware of the patents-in-suit when these patents were cited as prior art during the prosecution of six patents between 1986 through 1992. Sundstrand contends that this is insufficient to show meaningful notice, or that Sundstrand acted deliberately and intentionally. Sundstrand also contends that the six patents were not related to the APS 3200. Thus, there is no evidentiary basis for the jury to conclude that they would have provided notice of the patents-in-suit. Finally, Sundstrand also states that the testimony of Alan Gruebel, an APS 3200 controls engineer involved with the surge control logic during its formation, established that none of the Sundstrand employees who worked with the APS 3200 had knowledge of the six prior art references that referred to the Stokes patent.

Upon consideration of the record, the court finds that there was substantial evidence in the record to support the jury's finding of willfulness. Although Sundstrand claims that Honeywell's case is based on the fact that a handful of Sundstrand employees knew of the patents, but did not know of the potential for infringement, the court finds that the jury could have reasonably concluded that Sundstrand willfully infringed the patents-in-suit. In total, Honeywell offered evidence that more than a dozen Sundstrand engineers and lawyers had notice of the Honeywell patents by the early 1990s.

Honeywell offered evidence form which a jury could reasonably conclude that certain Sundstrand engineers who worked on the APS 3200 learned of the Honeywell surge control patents during the time that the APS 3200 was in development. For example, Honeywell offered evidence that Bill Treece, Sundstrand's director of engineering, and the chief engineer for the Sundstrand APU operation, wrote a memorandum to Sundstrand's patent attorney "requesting legal advice regarding potential patent infringement by competitor[s]," and that memorandum "include[ed] reference to the '194 patent." *See* PTX 206 at 2. Honeywell also presented evidence that Alan Gruebel's immediate manager, Steve Lampe, received a memorandum from Sundstrand's patent attorney that included reference to the '194 patent. *See* PTX 206 at 4. Gruebel testified that Lampe had some input into the APS 3200 surge control design. *See* Tr. at 1719.

Honeywell also offered evidence that Harold Williamson, senior attorney on Sundstrand's patent counsel staff had communications with Sundstrand engineers that contained references to the '194 patent. *See* PTX 206 at 1-4. In addition, Honeywell presented evidence that Sundstrand's outside patent counsel knew about the Honeywell surge control patents. For example, Honeywell introduced evidence that Sundstrand's counsel, William Van Santen, acknowledged that he had a copy of the '194 patent and had disclosed that patent to the Patent Office in 1988 as being pertinent to one of Sundstrand's surge control patent applications. *See* Tr. 783-86, 796-97, PTX 216. Honeywell also offered evidence showing that it was Van Santen's practice

to review patents he disclosed to the Patent Office. *See* Tr. at 781-82.

Honeywell also presented evidence that Sundstrand engineers had knowledge of and examined Honeywell's surge control system during its development of the APS 3200. For example, Honeywell introduced evidence which showed that Sundstrand had access to a document which discussed the operation of Honeywell's APUs. *See* Tr. at 529-30; PTX 65. This document was forwarded to four Sundstrand engineers who were working at the time on developing the control system for the APS 3200. *See* Tr. at 529. Honeywell also offered evidence that Sundstrand engineers knew about some aspects of Honeywell's patents. For example, Peter Suttie, project engineer for the control system of the APS 3200, testified that he "liked" certain aspects of the Honeywell design. *See* Tr. at 530.

In light of the record, the court concluded the jury's finding that Sundstrand willfully infringed the patents-in-suit was supported by substantial evidence. Therefore, the court will deny Sundstrand's motion for judgment as a matter of law.

b. Motion for a New Trial

Sundstrand first argues that the jury's verdict of willful infringement is against the clear weight of the evidence. In light of the evidence presented at trial, the court finds that contention to be unpersuasive. Sundstrand further contends that it

is entitled to a new trial because the court erroneously charged the jury on the issue. As a result of the court's alleged erroneous instruction, Sundstrand argues that the court effectively determined that any infringement would be willful.[22] According to Sundstrand, the court erred by not including its proposed instruction, which would have

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22 The relevant part of the court's instruction on willfulness reads:

> If you find that Hamilton Sundstrand infringed any of the claims of Honeywell's patents, and that such claims are valid, then you must further determine if the infringement was willful. Willful infringement requires proof that under the totality of the circumstances the accused infringer had actual knowledge of the patent and had no reasonable basis for believing that its product or process did not infringe the patent or that the patent was invalid. In defense, the infringer may rely on an opinion of counsel, that the patent is invalid, unenforceable, or not infringed if the infringer obtained the opinion promptly, if the opinion is competent, and if the reliance is in good faith. Honeywell must prove the willfulness of any infringement by clear and convincing evidence. If you find Honeywell has proven that Hamilton Sundstrand knew about the patent and did not exercise due care to determine whether or not it was infringing the patent, you may find that Hamilton Sundstrand's infringement was willful. Once a party obtains knowledge of a patent, it has an affirmative duty to exercise due care not to infringe the patent.

included language on the duty to investigate.[23] Sundstrand argues that by not giving the jury its proposed instruction, the court did not inform the jury that it could consider the context in which the individual employees came to know of the patents, or whether those employees appreciated the potential relationship between the accused device and the patents. Sundstrand further states that the jury was left to conclude that the duty to investigate was triggered because a handful of Sundstrand's employees and certain lawyers encountered the Stokes patents in a context wholly unrelated to the APS 3200. In essence, Sundstrand asserts that "[b]y not clarifying the meaning of corporate 'intent' in

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[23] Sundstrand proposed the following:

> In determining whether Hamilton Sundstrand had knowledge of the patents before [the relevant date], you should consider which of Hamilton Sundstrand's employees have been shown to have had information relating to the patents before that date and whether or not those employees were themselves engaged in activities related to the company's alleged infringing conduct at that time. For you to find that Hamilton Sundstrand had knowledge of the patents before February 3, 1999, Honeywell must show that the employees of Hamilton Sundstrand who you may find were aware of the patents had at that time a sufficient connection to the alleged infringement so that they would have a basis to cause Hamilton Sundstrand to consider the patents in connection with its decision-making about the allegedly infringing product. D.I. 276, at 37

these circumstances, the Court's instruction misstated the contours of the willfulness doctrine, and it did so to Hamilton Sundstrand's prejudice." D.I. 276 at 37.

In rejecting Sundstrand's proposed instruction, the court found that Sundstrand had failed to provide sufficient legal support for the proposition that there need be a particularly sufficient connection between Sundstrand employees who knew of the patents and the infringing APS 3200. *See* Tr. at 2359. Furthermore, the court instructed the jury that willfulness is to be determined under the totality of the circumstances. In looking at the totality of the circumstances, the jury would have necessarily looked at the context of the employees knowledge about the patents. Considering the lack of legal support for Sundstrand's proposed instruction and considering that the jury was instructed to determine willfulness under the totality of the circumstances, the court finds that it did not commit error in instructing the jury on willfulness. *See Lafate v. Chase Manhattan Bank*, 123 F.Supp.2d at 785 (explaining that the court must determine first, whether an error was in fact committed, and second, whether the error was prejudicial, in deciding if a new trial is warranted.)

D. Honeywell's Motion for Treble Damages, Attorneys Fees, Costs and Expenses and Prejudgment Interest.

Honeywell argues that the court should treble the jury's actual damages award and award it attorney's fees and costs. Honeywell further argues

that it is entitled to prejudgment and post-judgment interest on the jury's damages award.

1. Whether Honeywell is Entitled to Enhanced Damages, Attorney's Fees, and Costs?

When there is a finding of willful infringement, 35 U.S.C. § 284 gives the court discretion to increase the damages up to three times the amount found. A patentee is entitled to up to treble damages upon a finding of willfulness. *See* 35 U.S.C. § 284; *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 826 (Fed. Cir. 1992). A finding of willfulness, however, does not mandate enhanced damages, much less treble damages. *See Cybor Corp. v. FAS Techs, Inc.*, 138 F.3d 1448, 1451 (Fed. Cir. 1998) (citing *Modine Mfg. Co. v. The Allen Group, Inc.*, 917 F.2d 538, 543 (Fed. Cir. 1990)); *Read*, 970 F.2d at 826. "Rather, '[t]he paramount determination [for enhanced damages] . . . is the egregiousness of the defendant's conduct based on all the facts and circumstances.'" *Electro Scientific Indus., Inc. v. General Scanning, Inc.*, 247 F.3d 1341, 1353 (Fed. Cir. 2001) (citation omitted). Thus, enhancement of damages is within the discretion of the district court and is informed by the totality of the circumstances. *See State Indus., Inc. v. Mor-flo Indus., Inc.*, 948 F.2d 1573, 1576 (Fed. Cir. 1991).

The Federal Circuit has identified a number of factors to consider when deciding whether to enhance damages. These facts include: (1) evidence that the infringer deliberately copied the ideas or designs of the patentee; (2) evidence that the

infringer knew of the other's patent, investigated the scope of the patent, and formed a good-faith belief that it was invalid or that it was not infringed; (3) evidence of the infringer's behavior as a party to the litigation; (4) evidence of the infringer's size and financial condition; (5) evidence as to the closeness of the case; (6) evidence regarding the duration of the infringer's conduct; (7) evidence showing remedial action by the defendant; (8) evidence regarding defendant's motivation for harm; and (9) evidence as to whether the defendant attempted to conceal its misconduct. *See Read*, 970 F.2d at 826-29.

Upon consideration of the parties' submissions and the *Read* factors, the court finds that enhanced damages are not warranted in this case under 35 U.S.C. § 284. Although the evidence was sufficient to support the jury's finding of willfulness, the court finds that the evidence was not strong enough to warrant enhanced damages. Honeywell supports its willfulness argument by citing a broad range of circumstantial evidence, however, there was little direct evidence which evinced the sort of a culpable mindset that would make enhanced damages appropriate in this case. *But see e.g., SRI Int'l, Inc. v. Advanced Tech. Laboratories, Inc.*, 127 F.3d 1462, 1465-67 (Fed. Cir. 1997) (affirming district court's award of treble damages where memoranda and letters from the infringer's engineers sated that "we probably are infringing"). Also, the court finds that Sundstrand defenses although ultimately unsuccessful, were not frivolous and were litigated in good faith. Moreover, Sundstrand mounted a substantial challenge to Honeywell's infringement contentions. The issue of infringement was a close

case. *See e.g., C.R. Bard, Inc. v. Medtronic, Inc.*, No. 96-589-SLR, 1999 WL 458305, at *14 (D.Del. June 15, 1999). The court also finds that enhancement is inappropriate because, although the jury found that Sundstrand's infringement was willful, there is evidence that Sundstrand was partially motivated by economic pressure in the form of customer dissatisfaction. *See e.g.*, DTX 1602; *Read*, 970 F.2d at 827. Therefore, the court finds that enhancement of damages is inappropriate in this case.

For these same reasons, the court declines to find that this case is an "exceptional case" under 35 U.S.C. § 285. Section 285 provides that "in exceptional cases [the court] may award reasonable attorney fees to the prevailing party." Thus, the court will deny Honeywell's motion for attorney's fees and costs.

2. Whether Honeywell is Entitled to Prejudgment and Post-Judgment Interest?

Prejudgment interest should ordinarily be awarded absent some justification for withholding such an award. *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 657, 103 S. Ct. 2058, 76 L.Ed.2d 211 (1983). The United States Supreme Court stated that the award of prejudgment interest reflects the Patent Act's provision of complete compensation for the patent owner. *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 655, 103 S. Ct. 2058, 76 L.Ed.2d 211 (1983). Thus, a court should award prejudgment interest unless it has some justification for withholding such an award. *Id.* at 657, 103 S.Ct.

2058. Generally, prejudgment interest extends from the date of infringement to the date of judgment.

In this case, Honeywell seeks prejudgment interest on its reasonable royalty damages award and on its price erosion damages award. The court will grant Honeywell's motion for prejudgment interest on the reasonable royalty award. *See e.g., Joy Tech., Inc. v. Flakt, Inc.*, 954 F. Supp. 796, 808 (D. Del 1996) (awarding prejudgment interest on a reasonable royalty award).

The court will, however, deny Honeywell's motion for prejudgment interest on price erosion damages. At trial, Honeywell's expert, Julie Davis, testified to the jury that she included prejudgment interest in her damages calculation. Tr. at 1153. In light of this testimony, the court finds that the jury reasonably would have included prejudgment interest in its damages award. *See Graco Children's Prods., Inc. v. Century Prods. Co.*, No. Civ. A. 93-6710, 1996 WL 421966, at *35 (E.D. Pa. July 23, 1996) (denying motion for prejudgment interest where prevailing party included prejudgment interest as a part of the damages calculation it represented to the jury).

Finally, Honeywell also seeks post-judgment interest pursuant to 28 U.S.C. § 1961, which states that "[i]nterest shall be allowed on any money judgment in a civil case recovered in a district court." The court will also grant Honeywell's motion for post-judgment interest.

IV. CONCLUSION

For the foregoing reasons, the court finds that the jury's verdict was supported by substantial evidence. Therefore, the court will deny Honeywell's motion for judgment as a matter of law on the issue of literal infringement of Claim 4 of the '194 patent and Sundstrand's motions for judgment as a matter of law on the issues of liability, willfulness, and damages. In addition, the court finds that a new trial is not warranted on any issues and, therefore, will deny Sundstrand's motions for a new trial on all issues. In addition, the court finds that Honeywell is not entitled to enhanced damages or attorney's fees and costs. Finally, the court finds that Honeywell is entitled to post-judgment interest, and prejudgment interest on its reasonable royalty damages, but not prejudgment interest on its price erosion damages. The court will issue an order in conjunction with this opinion.

ORDER

For the reasons stated in the court's Memorandum Opinion of this same date, IT IS HEREBY ORDERED that:

1. Honeywell's Motion For Judgment as a Matter of Law on the Issue of Literal Infringement is DENIED;
2. Sundstrand's Motion For Judgment as a Matter of Law and For a New Trial on Issues Pertaining to Liability is DENIED;

3. Sundstrand's Motion for Judgment as a Matter of Law and for a New Trial on Issues Pertaining to Damages and Willfulness is DENIED;

4. Honeywell's Motion for Treble Damages, Fees, Costs, and Interest is DENIED in part and GRANTED in part;

a. Honeywell's Motion for Treble Damages and Attorney's Fees and Costs is DENIED;

b. Honeywell's Motion for Prejudgment Interest on Price Erosion Damages is DENIED; and

c. Honeywell's Motion for Prejudgment Interest on Reasonable Royalty Damages and Post-Judgment Interest is GRANTED.

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

No. Civ. A. 99-309 GMS.
Jan. 8, 2001

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant.

Josy W. Ingersoll, Young Conaway Stargatt & Taylor LLP, Wilmington, DE, Jonathan F. Putnam, Lee Ann Stevenson, Kirkland & Ellis, New York, NY, Robert J. Krupka, Kirkland & Ellis, Los Angeles, CA, for Plaintiff, of counsel.

Richard D. Kirk, Morris, James Hitchens & Williams LLP, Wilmington, DE, Richard F. Ziegler, David H. Herrington, Justin S. Anand, Cleary, Gottlieb, Steen & Hamilton, New York, NY, William E. McCracken. G. Christopher Braidwood, Thomas Miller, Marshall O'Toole, Gerstein, Murray & Borun, Chicago, IL, for Defendant, of counsel.

MEMORANDUM AND ORDER

SLEET, J.

Honeywell International Inc. ("Honeywell") filed this against Hamilton Sundstrand ("Sundstrand") in May of 1999 alleging that Hamilton Sundstrand Corporation ("Sundstrand") is infringing three Honeywell patents: the 4,380,893, 4,428,194 and the 4,337,615 (the "'893 patent," "'194 patent," and the "'615 patent," respectively).[1] The lawsuit relates to technology for auxiliary power units ("APU"). An APU is a small gas turbine engine, usually placed in the tail section of an airplane, that generates electricity for use while the aircraft is on the ground or in flight. An APU also provides compressed air for both starting the aircraft's main engine and environmental control of cabin air. Presently before the court is Sundstrand's Motion for Summary Judgment with regard to infringement and validity of Honeywell's '893 and '194 patents.

I. FACTS

Honeywell alleges that Sundstrand's APU, the APS 3200, infringes its '893 and '194 patents. Specifically, Honeywell contends that the APS 3200 literally infringes claim 4 of the '194 patent and that

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[1] On January 2, 2001, Honeywell advised the court that it has decided to no longer pursue its claims under the '615 patent.

it infringes the remaining asserted claims of both patents under the doctrine of equivalents. The '893 and '194 patents claim an apparatus and method for a system to control the aerodynamic phenomenon called surge in a compressor. The '893 and '194 patents were issued in 1983 and 1984, respectively, from the same original application. The '893 patent specifically claims an apparatus that embodies the control logic for the surge control system. The '194 patent specifically claims the method of using the control logic.

In its motion, Sundstrand argues that its APS 3200 does not literally infringe claim 4 of the '194 patent and that it does not infringe the remaining asserted claims of either patent under the doctrine of equivalents. Furthermore, Sundstrand contends that the '893 and '194 patents are invalid because both patents were anticipated by the prior art. Specifically, Sundstrand alleges that Claim 4 of the '194 patent and Claims 1, 12, 15, 19 and 23 of the '893 patent were anticipated by two articles. Sundstrand also argues that both the '893 and '194 patents are obvious in view of the prior art.

II. STANDARD OF REVIEW

"Summary judgment is appropriate only when 'there is no genuine issue as to any material fact and . . . the moving party is entitled to a judgment as a matter of law.'" *Rodime v. SeagateTech. Inc.*, 174 F.3d 1294, 1301 (1999) (quoting Fed. R. Civ. P. 56(c)). In reviewing the motion, the court must draw all reasonable inferences in favor of the non-movant.

See id. (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986)).

III. DISCUSSION

A. Validity

First, Sundstrand argues that the '893 and '194 patents are invalid because (1) they were anticipated by prior art and (2) they are both obvious in light of prior art. Under 35 U.S.C. § 382, a patent is presumed valid and the party attacking the validity has the burden of proving invalidity by clear and convincing evidence. *See* 35 U.S.C. § 382 (1984). "Clear and convincing evidence is evidence which proves in the mind of the trier of fact an abiding conviction that the truth of [the] factual contentions [is] highly probable." *See Jack Frost Labs v. Physicians & Nurses Manu. Corp.*, 901 F. Supp. 718, 727 (S.D.N.Y. 1995) (internal quotations omitted). Thus, Sundstrand must provide clear and convincing evidence that the '893 and '194 patents are invalid under either the doctrine of anticipation or obviousness before the court can grant summary judgment on these issues.

1. Anticipation

A claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference. *Celeritas Techs., Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998), *cert denied*, 525 U.S. 1106 (1999). Accordingly, invalidity by anticipation requires that the four corners of a single, prior art document

describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation. *Advance Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). The prior art need not state the elements of the claim in identical language. *See Proctor & Gamble v. Nabisco Brands, Inc.*, 711 F. Supp. 759, 762 (D. Del. 1989). Anticipation is a question of fact. *See in Re Graves*, 69 F.3d 1147, 1151 (Fed. Cir. 1995).

After reviewing the prior art references cited by Sundstrand, it is not clear that these articles anticipated the inventions at issue. Honeywell has adduced sufficient facts to show that there are genuine issue of material fact in dispute for a jury to resolve. Specifically, the parties dispute whether each and every limitation is found either expressly or inherently in the prior art references. This dispute in particular should be considered by a jury. There is also a factual dispute as to whether a person of ordinary skill in the art could practice the invention based on the prior art reference. Because there are factual issues to be determined by a jury, the court will deny Sundstrand's motion for summary judgment on the issue invalidity due to anticipation by prior art.

2. Obviousness

Section 103 prohibits the granting of a patent "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a) (1984). The ultimate determination of whether an invention would have been obvious under 35 U.S.C. § 103(a) is a legal conclusion based on underlying findings of fact. *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000). To determine the question of obviousness, the court should look to: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level or ordinary skill in the art; and (4) objective evidence of nonobviousness. *Riverwood Int'l Corp. v. The Mead Corp.*, 212 F.3d 1365, 1366 (Fed. Cir. 2000) (citing *Graham v. John Deer Co.*, 383 U.S. 1, 17 (1966)). "Such secondary considerations as commercial success, long felt but unsolved needs, [and] failure of others [to invent] are also relevant to the obviousness inquiry." *Ryko Manu. Corp. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991) (internal quotations omitted).

Obviousness may not be established using hindsight. *See Kahn v. General Motors Corp.*, 135 F.3d 1472, 1479 (Fed. Cir. 1998). In determining obviousness, the invention must be considered as a whole and the claims must be considered in their entirety. *Id.* at 1479-80. Moreover, when obviousness is based on a combination of two or more particular prior art references, there must be a

showing of a suggestion or motivation to combine the teachings of those references, though it need not be expressly stated. *Riverwood* at 1366. The ultimate determination of obviousness is a question of law based on underlying factual determinations. *Para-Ordnance Manufacturing Inc. v. SGS Importers Int'l Inc.*, 73 F.3d 1085, 1088 (Fed. Cir. 1995).

After considering the submissions of the parties, the court will also deny summary judgment on the issue of obviousness because there are outstanding factual disputes that should be resolved by a jury. For example, Honeywell disputes Sundstrand's description of the scope and content of the prior art. Honeywell also disagrees with Sundstrand as to the differences between the prior art references cited and the claims at issue. Moreover, Sundstrand does not present sufficient evidence as to the level of nonobviousness. Finally, Honeywell alleges that there are secondary factors that the court should consider that would render its invention nonobvious. Thus, the court will deny Sundstrand's motion for summary judgment as to the issue of the obviousness of the '893 and '194 patents because Honeywell has adduced sufficient evidence to show that there is a genuine issue of material fact for a jury.

B. Infringement

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device i.e., when "the properly construed claim reads on the accused device exactly." *KJC Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1358

(Fed. Cir. 2000). A device that does not literally infringe a claim may nonetheless infringe under the doctrine of equivalents if every element in the claim is literally or equivalently present in the accused device. *Sage Products, Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423 (Fed. Cir. 1997). A claim element is equivalently present in an accused device if only "insubstantial differences" distinguish the missing claim element from the corresponding aspects of the accused device. *Id.* Determinations of infringement, whether literal or under the doctrine of equivalents, is a factual matter normally reserved for a fact finder. *See Tate Access Floors, Inc. v. Maxcess Techs. Inc.*, 222 F.3d 958, 964 (Fed. Cir. 2000).

1. Literal Infringement of Claim 4 of the '194 Patent

First, the court will deny summary judgment as to literal infringement of Claim 4 of the '194 patent because Honeywell has managed to adduce facts which preclude the court from ruling in Sundstrand's favor as a matter of law on this issue. In particular, Honeywell has provided evidence demonstrating that there is a genuine factual dispute as to whether every element of Claim 4 of the '194 patent is embodied in Sundstrand's APS 3200. *See Honeywell's Opposing Brief*, D.I. 129, at 10-12.

2. The Doctrine of Equivalents and Prosecution History Estoppel Analysis

In its submissions,[2] Sundstrand argues that Honeywell cannot maintain its claims for infringement under the doctrine of equivalents in light of the Federal Circuit's decision in *Festo Corp. v. Kinzoku Kogyu Kabushiki Co.*, 2000 WL 1753646 (Fed. Cir. Nov. 29, 2000). In *Festo*, the Federal Circuit held that:

> When a claim amendment creates prosecution history estoppel with regard to a claim element, there is no range of equivalents available for the amended claim element. Application of the doctrine of equivalents to the claim element is completely barred (a "complete bar").

Id. at *9. In rejecting precedent, the *Festo* court reasoned that "[a] complete bar, unlike a flexible bar, thus lends certainty to the process of determining the scope of protection afforded by a patent. *Id.* at *17. Thus, "once an element of a claim is narrowed by amendment for a reason related to patentability, that element's scope of coverage will not extend beyond its literal terms." *Id.*

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2 Pursuant to Local Rule 7.1.2(c), Sundstrand sent a letter to the court advising it of new Federal Circuit case law on December 6, 2000.

Sundstrand contends that for each of the surge control patent claims at issue (other than claim 4 of the '194 patent), Honeywell is barred by prosecution history estoppel from asserting a claim for infringement under the doctrine of equivalents. Specifically, Sundstrand argues that during the prosecution of the '893 and '194 patents, the PTO Examiner rejected all of the claims that did not include the key element at issue based on the prior art and stated that he would only allow dependent claims that included this key element if rewritten into independent form. Sundstrand claims that based on this rejection, Honeywell amended its claims to incorporate the element at issue into the independent claims and canceled the original claims that lacked this element. Thus, Sundstrand contends, that when Honeywell amended its claims to rely on this key element to overcome the prior art, it created prosecution history estoppel. Thus, Sundstrand now argues that prosecution history estoppel now applies regarding the inlet guide vane position element.

Honeywell argues that the claims at issue were not rejected based on prior art. Instead, Honeywell contends that the patent examiner "objected" to these claims as written. Honeywell further claims that the patent examiner did allow these claims, however, if they were "rewritten in independent form." Thus, according to Honeywell, the key element at issue was not amended during prosecution of the patents and the *Festo* decision would not apply to this case.

"Prosecution history estoppel precludes a patentee from obtaining under the doctrine of equivalents coverage of subject matter that has been relinquished during the prosecution of its patent application." *Festo*, (quoting *Pharmacia & Upjohn Co. v. Mylan Pharms., Inc.*, 170 F.3d 1373, 1376 (Fed. Cir. 1999)). In other words, "[t]he essence of prosecution history estoppel is that a patentee should not be able to obtain, through the doctrine of equivalents, coverage of subject matter that was relinquished during prosecution to procure issuance of the patents." *Hoganas AB v. Fresser Indus., Inc.*, 9 F.3d 948, 952 (Fed. Cir. 1993) (citation omitted). "The logic of prosecution history estoppel is that the patentee, during prosecution, has created a record that fairly notifies the public that the patentee has surrendered the right to claim particular matter as within the reach of the patent." *Festo*, at *3. In fact, the *Festo* court describes the functions of prosecution history estoppel as preserving the notice function performed by the claims and preventing patent holders from recapturing under the doctrine of equivalents subject matter that was surrendered before the Patent Office. *See id.* at *6. Whether prosecution history bars an assertion of infringement under the doctrine of equivalents is a matter of law for the court to decide. *See Festo* at *26. This decision can be made on a dispositive pretrial motion or at the close of evidence after a jury verdict. *See id.*

In order to determine if prosecution history estoppel will apply, the court must first determine which claim elements are alleged to be met by equivalents. *See Festo*, 2000 WL 1753646, at *27 ("The first step in a prosecution history estoppel

analysis is to determine which claim elements are alleged to be met by equivalents."). In this case, the claim elements at issue involve "adjusting the set point in response to variations in the position of the inlet guide vanes" and the "delta P over" flow related parameter. *See* Honeywell's Opposing Brief, D.I. 129, at 16-22.

Then, the court must determine whether the elements at issue were amended during prosecution of the patent. *Festo*, 2000 WL 1753646, at *27. "If they were not, amendment-based estoppel will not bar the application of the doctrine of equivalents." *Id.* "However, the court still may need to consider whether statements made during prosecution give rise to argument-based estoppel." *Id.* If the claim elements at issue were amended, the court first must determine whether the amendment narrowed the literal scope of the claim. *Id.* If so, prosecution history estoppel will apply unless the patent holder establishes that the amendment was made for a purpose unrelated to patentability. *Id.* If the patent holder fails to do so, prosecution history estoppel will bar the application of the doctrine of equivalents to that claim element. *Id.*

In this case, the parties dispute whether the elements at issue were actually amended. Thus, in order to resolve the dispute, the court must engage in a detailed review of the relevant prosecution history.

a. '893 Patent Prosecution History

When the '893 file application was filed, 52 claims were presented. *See* '893 File History, D.I. 138, at Ex. 9. The patent examiner initially determined that claims 41-52 were materially distinct from claims 1-40. *Id.* After an initial telephone conversation on this issue on August 27, 1982, the patentee withdrew claims 41-52 from consideration (subsequently, these claims were submitted in the application for the '194 patent). *Id.* Of the remaining claims, claims 1, 6, 11, 16, 21 and 32 were independent claims. The rest were dependent claims. *Id.*

Next, the patent examiner rejected claims 1-5, 11-15, and 21-40 for indefiniteness under 35 U.S.C. § 112. *Id.* Claims 28, 31, 34 and 37 were deemed ambiguous. *Id.* The following claims were rejected based on the prior art: 1-3, 6, 7, 10-13, 16, 19-22, 27-29, 32, 37, 38, 39 and 40. *Id.* In rejecting these claims, the examiner made specific reference to the relevant prior art and the reason for rejection relating to each claim. *Id.* Thus, the only claims remaining were claims 8, 9, 17 and 18. All of these claims were dependent claims. Claims 8, 9, 17 and 18 involve the claim elements at issue in this case. The examiner objected to these claims because of their form, but stated that they would be "allowed if rewritten in independent form." *Id.*

b. '194 Patent Prosecution History

As discussed above, claims 41-52 of the original '893 application were submitted to the

patent office. Of these claims, only 41, 48, and 52 were independent claims. *See id.* The patent examiner rejected claims 41-43, 44, 45, 48, 49 and 52 based on the prior art. *Id.* at Ex. 11. Only claims 46, 47, 50 and 51 remained. *Id.* Again, all of these claims were dependent claims and involved the claim elements at issue in this case. *Id.* Again, the examiner objected to these claims because of their form, but stated that they would be "allowed if rewritten in independent form." *Id.*

After reviewing the prosecution history, the court concludes that the elements at issue were not amended, and thus, prosecution history estoppel will not apply to this case. *See Festo*, at *27. Sundstrand argues that by canceling broader claims that lacked the inlet guide vane position element[3] and advancing only claims that included the element, Honeywell created the "classic basis" for prosecution history estoppel. D.I. 179. Thus, Sundstrand argues that a claim need not be rejected for prosecution history estoppel to apply. To support its position, Sundstrand cites to *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 681 (Fed. Cir. 1988) and *Builders Concrete, Inc. v. Bremerton Concrete Products Co.*, 757 F.2d 255, 260 (Fed. Cir. 1985). Although this argument has superficial appeal, the

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3 Although there are two elements at issue in this case, the parties only argue about the inlet guide vane element in their papers. Despite this omission in their papers, the court's analysis also applies to the "delta P over" flow related parameter element.

court is not persuaded that prosecution history estoppel applies in this case.

The key distinction between the present case and the cases cited by Sundstrand is that the patentees in those cases surrendered the elements at issue when they resubmitted their claims. For example, in *Diversitech*, the claim at issue also had not been substantively amended and was initially dependent on a broader claim that was rejected. *Id.* at 681. The patentee in that case, however, expressly made arguments before the PTO that surrendered the element at issue. *Id.* Thus, because "[t]he Board rejected and [the patentee] cancelled the only claims that were broad enough to encompass his disclosed embodiment of a pad with a thin layer of cement on the bottom," the patentee could not "now contradict the representations it made in order to obtain the allowed claims." *Id.*

Again, in *Builder's Concrete*, there was also no amendment to the claim at issue during prosecution. *See id.* at 260. It was still clear, however, that arguments made for the patentability of a different claim, claim 1, relinquished the elements at issue in that case. *See id.* "The fact that the 'passage' clause of patent claim 10 was not itself amended during prosecution does not mean that it can be extended by the doctrine of equivalents to cover the precise subject matter that was relinquished in order to obtain allowance of claim 1." *Id.*

In this case, Honeywell did not surrender the elements at issue during the prosecution of the patents at issue. "When an accused device is the

same as a disclosed embodiment, and claims covering the disclosed embodiment were rejected on appeal and cancelled, the yielded claim scope can not be recovered in order to encompass the accused device through the doctrine of equivalents." *Diversitech*, 850 F.2d at 681. Honeywell did not give up an embodiment of the invention with the inlet guide vane. In fact, this element was essentially all that was allowed. The patent examiner rejected substantially all of the original claims based on the prior art. However, the remaining dependent claims would be allowed if rewritten into independent form. Since the examiner had rejected all of the other claims, these claims had to be rewritten because they would no longer make sense as written in dependent form. In this case, the elements at issue were not surrendered at all. Prosecution history estoppel does not apply. Thus, in accordance with *Festo* , this court rules as a matter of law that Honeywell may attempt to convince the jury that Sundstrand's APU 3200 infringes under the doctrine of equivalents. *See Festo* at *26 (advising the court to rule as a matter of law on a pretrial dispositive motion whether prosecution history bars an assertion of infringement under the doctrine of equivalents).

As to the issue of infringement under the doctrine of equivalents, Honeywell has managed to adduce facts that create a genuine dispute over whether there is a substantial difference between the APS 3200 and claims 1-5, 8-15, 19, 22 and 23 of the '893 patent and claim 1 of the '194 patent. Because the court concludes that prosecution history estoppel does not apply here, and there are genuine issues of material fact in dispute, the court cannot rule as a

matter of law that Sundstrand's APS 3200 does not infringe Honeywell's patents under the doctrine of equivalents.

For these reasons, IT IS HEREBY ORDERED that:

1. Hamilton Sundstrand's Motion for Summary Judgment with regard to infringement and validity of Honeywell's '893 and '194 patents (D.I. 103) is DENIED.

2. Honeywell is not barred by prosecution history estoppel from maintaining its claim of infringement of the '893 and '194 patents under the doctrine of equivalents.

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

02-1005, -1082

HONEYWELL INTERNATIONAL INC., and Honeywell Intellectual Properties, Inc.,

Plaintiffs-Appellants,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant-Cross Appellant.

ORDER
Entered February 5, 2004

Before MAYER, Chief Judge, NEWMAN, MICHEL, LOURIE, CLEVENGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges.

This matter, having been argued before a panel of three judges on August 7, 2002, and thereafter, having been referred to the circuit judges who are in regular active service and a poll having been taken,

IT IS ORDERED THAT:

(1) The appeal will be decided en banc, without additional briefing.
(2) There will be no additional oral argument held.

Entered for the Court
JAN HORBALY, Clerk

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

02-1005, -1082

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs-Appellants,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant-Cross Appellant.

ORDER
Entered February 26, 2004

Before MAYER, Chief Judge, NEWMAN, MICHEL, LOURIE, CLEVENGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges.

Honeywell International Inc. and Honeywell Intellectual Properties Inc. (collectively "Honeywell") move for leave to file a 20 page supplemental brief and present additional oral argument. Honeywell advises that Hamilton Sundstrand does not consent to this motion.

Upon consideration thereof,

IT IS ORDERED THAT:

The motion is denied.

Circuit Judge Newman dissents to the denial of Honeywell's motion to file a brief.

Entered for the Court
JAN HORBALY, Clerk

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

No. 2006-1602
April 18, 2008

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs-Appellants,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant-Appellee.

Robert G. Krupka, Kirkland & Ellis LLP, of Los Angeles, CA, argued for plaintiffs-appellants. With him on the brief were Jonathan F. Putnam, Lee Ann Stevenson, and Kevin N. Malek, of New York, NY.

Mark L. Levine, Bartlit Beck Herman Palenchar & Scott LLP, of Chicago, IL, argued for defendant-appellee. With him on the brief were Chris J. Lind and Brian C. Swanson. Of counsel on the brief was David H. Herrington, Cleary Gottlieb Steen & Hamilton LLP, of New York, NY.

Before NEWMAN, RADER, and DYK, Circuit Judges.

RADER, Circuit Judge.

Honeywell International, Inc. and Honeywell Intellectual Properties, Inc. (collectively "Honeywell") brought suit against Hamilton Sundstrand Corporation ("Sundstrand") for infringement of claims 8, 10, 11, 19, and 23 of United States Patent No. 4,380,893 ("the '893 patent") and claim 4 of Patent No. 4,428,194 ("the '194 patent"). Because "rewriting of dependent claims into independent form coupled with the cancellation of the original independent claims creates a presumption of prosecution history estoppel," this court vacated an earlier infringement verdict in favor of Honeywell and remanded to determine whether Honeywell could rebut the presumption of surrender under *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002)(*Festo VIII*),*remanded to*344 F.3d 1359 (Fed.Cir.2003) (en banc) (*Festo IX*). *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1134 (Fed.Cir.2004) (en banc) (*Honeywell II*). On remand, the United States District Court for the District of Delaware barred Honeywell from asserting the doctrine of equivalents. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No. 99-309, 2006 WL 2346446, *1, 2006 U.S. Dist. LEXIS 57030, at *2 (D.Del. Aug. 14, 2006) (*Honeywell III*). Because Honeywell did not show that the alleged equivalent was unforeseeable at the time of the narrowing amendment or that the narrowing amendment bore no more than a tangential relation to the alleged equivalent, this court affirms.

BACKGROUND I

The patents at issue claim technology to control airflow surge in auxiliary power units or "APUs." An APU is a gas turbine engine often used in the tail end of aircraft. The APU generates electricity for the aircraft and includes a load compressor to supply compressed air for starting the aircraft's main engines and for controlling the cabin's environment during flight. Because APUs face rapidly changing demand levels for compressed air during flight, they must control against "surges." A surge is an aerodynamic phenomenon, which occurs when airflow through the compressor is too low. In a surge condition, the airflow cannot exit the compressor. Instead, the airflow surges back into the compressor, potentially damaging the APU.

A surge control system maintains a minimum level of airflow through the compressor at all times. Conventional systems provided a wide safety margin by drawing more air than required into the compressor's main air duct and venting the excess through a surge bleed valve. While effective, these prior art systems were inefficient. Honeywell's patents claim a more efficient APU surge control system. Honeywell's invention establishes a "set point" that represents the minimum flow to avoid surges. "Ambient air ... is drawn through a set of adjustable inlet guide vanes ('IGV')...." '893 Patent col.3 ll.64-65. The IGVs open and close like Venetian blinds and regulate the amount of ambient air drawn into the load compressor. The value of the set point is "a function of the position of said [IGVs]."*Id.* col.12 ll.11-12. The invention regulates this set point by comparison to a "flow-related parameter" that measures airflow out of the compressor. *Id.* col.2 ll.

48-54. "Thus a comparison is made between the actual flow conditions (represented by the flow-related parameter) and the desired flow conditions (represented by the set point)." *Honeywell II, 370 F.3d at 1134.* The invention generates an error signal if the airflow through the compressor is too low. In response to this signal, the inventive APU determines the proper setting of the surge bleed valve to prevent a build up of pressure and maintain sufficient airflow. ' 194 Patent col.2 ll.12-20, 55-60.

The '194 patent issued from a divisional of the application that issued as the '893 patent. During prosecution of the '893 patent, to overcome a rejection under 35 U.S.C. § 121, the applicant separated the system claims from the method claims. The system claims issued in the '893 patent, and the method claims issued in the '194 patent. The independent claims on appeal are claims 8 and 19 of the '893 patent and claim 4 of the '194 patent. Each of these claims requires the APU to include IGVs, which are used by the surge control system. These independent claims were dependent claims 17, 35 and 51 in the original application that ultimately issued as the '863 patent. The original independent claims (application claims 16, 32 and 48) did not contain any reference to IGVs or any use of the position of these guide vanes in the surge control system. The United States Patent and Trademark Office rejected the original independent claims as obvious in light of the prior art, but allowed the dependent claims when rewritten into independent form. Claims 8 and 19 of the '893 patent state:

8. A gas turbine engine accessory power unit having a fluctuating compressed air supply demand, said accessory power unit comprising:
(a) *a compressor having adjustable inlet guide vanes;*
(b) duct means for receiving compressed air discharged from said compressor and supplying the received air to the pneumatically-powered apparatus;
(c) surge bleed means operable to exhaust from said duct means a selectively variable quantity of air to assure at least a predetermined minimum flow rate through said duct means and thereby prevent surge of said compressor;
(d) sensing means for sensing the value of a predetermined, flow-related parameter within said duct means and generating an output signal indicative of said value, said value of said flow-related parameter being substantially independent of the temperature of the compressed air;
(e) comparator means for receiving said sensing means output signal and generating an error signal representing the difference between the sensed value of said parameter and a desired value thereof, said comparator means having an adjustable control set point representing said desired value of said parameter;
(f) *means for transmitting to said comparator means a reset signal for varying said set point as a function of the position of said inlet guide vanes in accordance with a predetermined reset schedule; and*
(g) control means for receiving said error signal and transmitting to said surge bleed means a

control signal to operate said surge bleed means, the magnitude of said control signal having, relative to the magnitude of said error signal, a proportional component and an integral component, whereby said minimum flow rate through said duct means is essentially constant regardless of the compressed air supply demand of the pneumatically-powered apparatus.
'893 Patent col.11 l.52-col.12 l.23 (emphases added).

19. A control system for assuring a substantially constant minimum flow rate through a duct receiving air discharged from a compressor or the like *having adjustable inlet guide vanes*, the duct having a supply outlet connected to pneumatically-operated apparatus having a variable supply air demand, the duct further having an exhaust outlet, said control system comprising:
(a) a flow regulating device adapted to be positioned in the exhaust outlet and operable to selectively vary air flow outwardly therethrough;
(b) a sensing device having a sensing portion adapted to be positioned in the duct to sense therein a predetermined parameter related to the air flow rate through the duct, said sensing device further having an output portion;
(c) an adjustable set point comparator having an input portion coupled to said output portion of said sensing device, and an outlet adapted to generate an error signal;
(d) a proportional controller having an inlet coupled to said output of said comparator and further having an outlet;

(e) an integral controller having an inlet coupled to said outlet of said comparator and further having an outlet;
(f) a summer having a first inlet coupled to said outlet of said proportional controller, a second inlet coupled to said outlet of said integral controller, and an outlet coupled to said flow regulating device; and
(g) a guide vane position sensor and a function generator coupled in series between the inlet guide vanes and said input portion of said comparator.
Id. col. 4 l.62-col. 16 l.22 (emphases added).

Claim 4 of the '194 patent states:

4. A method of utilizing a compressor of a gas turbine engine to power pneumatically-operated apparatus having a variable inlet air flow demand, *the compressor having adjustable inlet guide vanes*, said method comprising the steps of:
(a) interconnecting a supply duct between the compressor and the pneumatically-operated apparatus;
(b) flowing discharge air from the compressor through said supply duct to the pneumatically-operated apparatus;
(c) maintaining an essentially constant minimum supply duct flow rate, despite fluctuations in the flow rate of air received by the pneumatically-operated apparatus, by exhausting air from said supply duct in response to variations therein of the value of a predetermined, flow-related parameter, the flow rate of air exhausted from said supply duct being related to the magnitude of said parameter value variations in both a proportional and time-integral manner, said maintaining step

including the steps of providing an outlet passage from said supply duct, positioning in said outlet passage a surge bleed valve operable to selectively vary the flow of air outwardly through said outlet passage, generating an integral control signal in response to said variation in said flow-related parameter, generating a proportional control signal in response to said variations in said flow-related parameter, and simultaneously utilizing said integral and proportional control signals to operate said surge bleed valve; and

(d) *adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes.*

'194 Patent col. 10 l.64-col. 12 l.16 (emphases added).

Sundstrand manufactures the APS 3200, an APU device with a surge control system that compares a flow-related parameter called DELPQP to a set point based on air inlet temperature and adjusts the surge bleed valve in response. DELPQP is an acronym for delta P over (quotient) P and measures pressure differentials as a proxy for airflow. At high flow levels, DELPQP can lead to an ambiguous signal, where DELPQP becomes inversely proportional to the amount of flow. The ambiguous signal may cause the system to open the surge bleed valve unnecessarily to increase flow. This incorrect reading issue is known as the double solution or inverted-V problem. The APS 3200 solves this problem by blocking the control signal during high-flow conditions. The system uses in part IGV position to determine whether the APU is experiencing high

flow or low flow, and consequently whether to block the control signal.

Honeywell filed suit on May 17, 1999 alleging that Sundstrand's APS 3200 infringed claims of three of its patents, including the '893 and '194 patents. Sundstrand filed a motion for partial summary judgment to limit damages to those incurred after February 3, 1999, the date it received actual notice of Honeywell's infringement allegations, because Honeywell did not mark its product under 35 U.S.C. § 287(a). Honeywell conceded that it did not mark its product with the '893 patent, but argued that the '194 method claim patent did not permit or require marking. The district court disagreed, granting partial summary judgment and holding that because both patents refer to the same tangible product, Honeywell could and should have marked the product. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, No 99-309, 2001 WL 66345, at *3-4 (D.Del. Jan.4, 2001). The district court also held that Honeywell could not recover damages for sales entered into before to February 3, 1999, even if delivery occurred thereafter. Honeywell Int'l Inc. v. Hamilton Sundstrand Corp., No. 99-309 (D.Del. Feb. 8, 2001).

On February 16, 2001, a jury found that Sundstand infringed claims of the '893 and '194 patents under the doctrine of the equivalents. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 166 F.Supp.2d 1008, 1013-14 (D.Del.2001)(*Honeywell I*). The jury further found that Honeywell was entitled to $45,000,000 in price erosion damages and $1,578,065 in reasonable royalty damages. *Id.* at

1014. The district court denied Sundstrand motions for judgment as a matter of law ("JMOL") and a new trial. *Honeywell II*, 370 F.3d at 1138. Both parties appealed. On February 5, 2004, this court, sua sponte, ordered that the case would be resolved en banc, without further arguments from the parties. *Id.* at 1139. The court held that Honeywell's act of "rewriting [the] dependent claims into independent form coupled with the cancellation of the original independent claims creates a presumption of prosecution history estoppel." *Id.* at 1134. Thus, the court vacated the judgment of infringement and remanded the case for the "determination of whether Honeywell [could] rebut the presumption...."*Id.*

On remand, the district court held a two-day bench trial to determine whether prosecution history estoppel barred Honeywell from asserting the doctrine of the equivalents. *Honeywell III*, 2006 WL 2346446, *1, 2006 U.S. Dist. LEXIS 57030, at *2. The parties contested the definition of the alleged equivalent element. In reaching its decision, the district court adopted Honeywell's articulation: "the Sundstrand APS 3200 surge control system with its unique DELPQP flow-related parameter and its particular use of the inlet guide vane position as part of the high-flow logic that that parameter occasioned." *Id.*, 2006 WL 2346446, **4-5, 2006 U.S. Dist. LEXIS 57030 at *13-14. The district court correctly stated that Honeywell could rebut the presumption of surrender by demonstrating that (1) "the alleged equivalent would have been unforeseeable at the time of the narrowing amendment," or (2) "the rationale underlying the narrowing amendment bore no more than a

tangential relation to the equivalent in question," or (3) "that there was 'some other reason' suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent." *Id.*, 2006 WL 2346446, *5, 2006 U.S. Dist. LEXIS 57030 at *14 (quoting *Festo IX*, 344 F.3d at 1369).

Honeywell conceded the "some other reason" criterion. *Honeywell Int'l Inc. v. Hamilton Sunstrand Corp.*, No 99-309, 2006 WL 2346446 (D.Del. Aug.14, 2006). Thus, the district court focused on tangentiality and foreseeability. Because the parties agreed that the tangentiality inquiry should be decided solely on the prosecution history, the parties presented evidence at the bench-trial only on the issue of foreseeability. Honeywell argued that in the 1982-83 timeframe-which the parties agreed is the relevant period-the use of DELPQP and IGV position to detect surge was unforeseeable. Sundstrand argued that an APU developed in the late 1970's, the L1011, also measured a static pressure differential to avoid the double solution problem experienced by the APS 3200.

The L1011, however, distinguished between high flow and low flow through the use of a shock switch, rather than through IGV position. Supersonic speeds activated the shock switch, which caused the system to ignore the control signal and maintain the valves in their high flow position. These differences aside, the district court held that it was "quite intuitive" that it was foreseeable, in 1982-83, to one skilled in the art to measure the position of IGVs to distinguish between high flow and low flow. *Id.*, 2006 WL 2346446, *6, 2006 U.S. Dist. LEXIS 57030 at

*17. The district court recognized that both parties presented sufficient evidence to support their respective positions, but opined that the resolution was not a close call. *Id.*, 2006 WL 2346446, *6 n. 2, 2006 U.S. Dist. LEXIS 57030 at. *17 n. 2.

Turning to the tangential relation prong, the district court noted that the focus of this inquiry is on "the patentee's objectively apparent reason for the narrowing amendment." *Id.*, 2006 WL 2346446, *6, 2006 U.S. Dist. LEXIS 57030 at *19 (citing *Festo IX*, 344 F.3d at 1369). Honeywell argued that the reason for the underlying amendment was to overcome prior art that disclosed a surge control system with P and Delta P sensors and proportional and integral control, and that had nothing to do with IGVs. The district court disagreed with this characterization, as the DELPQP is a parameter that is also calculated by measuring P and Delta P. Thus, both the prior art and the equivalent in question involved the same flow-related measurement and the use of that measurement is directly related to the rationale underlying the amendments. Therefore, Honeywell did not rebut the presumption with the tangential relation prong. *Id.*, 2006 WL 2346446, *8-9, 2006 U.S. Dist. LEXIS 57030 at *24-26.

Honeywell filed a timely appeal, asserting that it had rebutted the presumption of prosecution history estoppel under the foreseeability and tangential relation criteria. Honeywell also appeals the district court's pre-trial rulings limiting its damages claim under the method-only '194 patent and excluding from recovery reasonable royalties resulting from sales contracts entered before the

notice letter date. Sundstrand argues that even if Honeywell is not estopped from alleging infringement under the doctrine of equivalents, the jury's verdict lacks sufficient support from trial evidence. This court has jurisdiction under 28 U.S.C. § 1295(a)(1).

II

"Prosecution history estoppel is a legal question subject to de novo review on appeal." *Cybor Corp. v. FAS Techns. Inc.*, 138 F.3d 1448, 1460 (Fed.Cir.1998) (en banc). This court, however, reviews any factual issues underlying the inquiry for clear error. See *Festo IX*, 344 F.3d at 1369-70. This court reviews a district court's denial of a motion for JMOL de novo, applying the JMOL standard used by the district court. *Interactive Pictures Corp. v. Infinite Pictures, Inc.*, 274 F.3d 1371, 1375 (Fed.Cir.2001). JMOL is appropriate when "there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue." Fed.R.Civ.P. 50(a)(1). This court also reviews a district court's grant of summary judgment without deference. *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1334 (Fed.Cir.2006).

Under the doctrine of the equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997) (citing *Graver Tank & Mfg.*

Co. v. Linde Air Prods. Co., 339 U.S. 605, 609, 70 S.Ct. 854, 94 L.Ed. 1097 (1950)). The doctrine of prosecution history estoppel prevents a patent owner from recapturing with the doctrine of equivalents subject matter surrendered to acquire the patent. See *Festo IX*, 344 F.3d at 1365 (citing *Festo VIII*, 535 U.S. at 741, 122 S.Ct. 1831).

Because the three asserted independent claims were rewritten from dependent form and because the original independent claims were cancelled, there is a presumption of prosecution history estoppel. See *Honeywell II*, 370 F.3d at 1134. Nonetheless Honeywell may rebut that presumption with a showing that: (1) "the alleged equivalent would have been unforeseeable at the time of the narrowing amendment" or (2) "the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent in question." *Festo IX*, 344 F.3d at 1369 (quoting *Festo VIII*, 535 U.S. at 741, 122 S.Ct. 1831).

A. Foreseeability

On remand from the Supreme Court in Festo, this court explained that the foreseeability criterion

> presents an objective inquiry, asking whether the alleged equivalent would have been unforeseeable to one of ordinary skill in the art at the time of the amendment. Usually, if the alleged equivalent represents later-developed technology (e.g., transistors in relation to vacuum tubes, or Velcro (R) in

> relation to fasteners) or technology that was not known in the relevant art, then it would not have been foreseeable. In contrast, old technology, while not always foreseeable, would more likely have been foreseeable. Indeed, if the alleged equivalent were known in the prior art in the field of the invention, it certainly should have been foreseeable at the time of the amendment. By its very nature, objective unforeseeability depends on underlying factual issues relating to, for example, the state of the art and the understanding of a hypothetical person of ordinary skill in the art at the time of the amendment. Therefore, in determining whether an alleged equivalent would have been unforeseeable, a district court may hear expert testimony and consider other extrinsic evidence relating to the relevant factual inquiries.

Id. at 1369 (citation omitted). Subsequently, we clarified that "[a]n equivalent is foreseeable if one skilled in the art would have known that the alternative existed in the field of art as defined by the original claim scope, even if the suitability of the alternative for the particular purposes defined by the amended claim scope were unknown." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 493 F.3d 1368, 1382 (Fed.Cir.2007)*(Festo X)*.

The principle of foreseeability ties patent enforcement appropriately to patent acquisition. In

making this connection, foreseeability reconciles the preeminent notice function of patent claims with the protective function of the doctrine of equivalents. Thus, foreseeability in this context ensures that the doctrine does not capture subject matter that the patent drafter could have foreseen during prosecution and included in the claims. The goal of the principle is to ensure that the claims continue to define patent scope in all foreseeable circumstances, while protecting patent owners against insubstantial variations from a claimed element in unforeseeable circumstances. The foreseeability principle thus relegates the doctrine of equivalents to its appropriate exceptional place in patent enforcement.

To maintain consistency, a court must use the same definition of the equivalent to evaluate both foreseeability and infringement. As we explained in *Festo X*, adoption of different equivalents for infringement and foreseeability would produce perverse results. *Id.* at 1381. Under such a paradigm, patentees and accused infringers would reverse roles when arguing whether the equivalent met the test for infringement on the one hand, and foreseeability, on the other. *Id.* In this instance, the district court found that even the narrow equivalent proposed by Honeywell was foreseeable and thus precluded by estoppel principles. We agree.

To evaluate whether Honeywell can overcome the presumption of surrender, like the district court, this court assumes that Honeywell's proposed articulation of the equivalent element is correct: "the use of (1) a static pressure differential (i.e., DELPQP), which can be indicative of surge only if

the APU is experiencing low flow, in combination with (2) IGV position, which is indicative of whether the APU is experiencing low flow or high flow, to detect surge." *Honeywell III*, 2006 WL 2346446, **4-5, 2006 U.S. Dist. LEXIS 57030, at *13-14.

This court must examine, on the basis of this record, whether the use of IGV position to detect high flow and low flow was later-developed technology and thus unforeseeable at the time of the amendments during the prosecution process. The timing of Sundstrand's product development does not settle the issue. The record shows that Sundstrand developed its equivalent between 1991 and 1995, after the relevant amendments in 1982-83. The mere temporal relationship of the equivalent to the patent acquisition and amendment process, however, does not make the equivalent unforeseeable. The record shows that Sundstrand began using IGV position to control airflow within two months of observing the double solution problem, which suggests that the IGV solution may have been known (and foreseeable) in the art. The record also shows that Sundstrand refined this way of addressing the problem over the next four years-evidence susceptible to characterization as either showing difficulty in reaching the ultimate solution or showing the natural and foreseeable application of well-known principles.

However, Honeywell contends that the district court's determination was clearly erroneous because in the 1982-83 time frame surge control systems did not use inlet guide vane position to ascertain the existence of high or low flow situations for surge

control. Honeywell is correct that the systems in the 1982-83 time period did not use inlet guide vane position for this purpose, but it was known that the control of surge was important; that systems, such as the L1011 system, had been developed for that purpose; and that inlet guide vanes were routinely used in surge control systems and affected the air flow rate. For example, U.S. Patent No. 4,164,035 ("the Glennon patent"), issued in 1979, claims a surge control system and teaches that IGV position affects airflow rate. Honeywell's expert, Mr. Muller, also testified:

> Q: In fact, going back to the 1970s, it was Honeywell's understanding that in order to efficiently control surge, you would need to take into account inlet guide vane angle and input into your surge control system. Correct?
> A: Well, by using this information you can incrementally improve the operation of a surge controller yes.

The record also shows no technical barrier to the use of IGV position to determine air flow, as Honeywell's corporate representative, James Clark, admitted. He confirmed that Honeywell "could have [ ] solved [the double solution problem] using inlet guide vane position" in the 1970s. Foreseeability does not require that the accused infringing product or process be foreseeable, nor that any equivalent exist at the time; rather foreseeability only requires that one of ordinary skill in the art would have reasonably foreseen the proposed equivalent at the pertinent time. *Festo X*, 493 F.3d at 1382.

Sunstrand's expert, Dr. Japiksi, whom the district court found to be credible, concluded that it was "known or foreseeable to a person of ordinary skill in the art in 1982 to use IGV position to determine whether the flow was high or low." Based on this testimony and the record evidence described above, the district court concluded that "measuring IGV position ... is a reasonably obvious way-both at present and in 1982-83-to determine whether the APU is experiencing high flow or low flow." *Honeywell III*, 2006 WL 2346446, *6, 2006 U.S. Dist LEXIS 57030, at *17. This court finds no clear error in the district court's conclusion.

While both parties presented expert witnesses, the district court determined, after observing the witnesses' demeanor and credibility, that the resolution was not close. *Id.*, 2006 WL 2346446, *6, 2006 U.S. Dist. LEXIS 57030 at *17 n. 2. The Supreme Court has instructed: "[W]hen a trial judge's finding is based on his decision to credit the testimony of one of two or more witnesses, each of whom has told a coherent and facially plausible story that is not contradicted by extrinsic evidence, that finding, if not internally inconsistent, can virtually never be clear error." *Anderson v. City of Bessemer City*, 470 U.S. 564, 575, 105 S.Ct. 1504, 84 L.Ed.2d 518 (1985); *The Am. Original Corp. v. Jenkins Food Corp.*, 774 F.2d 459, 462 (Fed.Cir.1985). As discussed above, while the timing of Sundstram's product development is ambiguous with respect to the foreseeability criterion, much of the extrinsic evidence-most notably several prior art references in the record-supports the district court's decision.

Thus, the record supports the district court's finding that a person of ordinary skill in the art would have known of the use of IGV position to distinguish between high and low flow in order to resolve the double solution problem during 1982-83. Honeywell could have foreseen and included the alleged equivalent in the claims when they were amended. As a result, Honeywell did not rebut the presumption of surrender with evidence of unforeseeability.

This court also discerns no fatal error in connection with Federal Rule of Civil Procedure 52. This court perceives that the trial court did not offend the requirement to "find the facts specially." Fed.R.Civ.P. 52; *Consolidated Aluminum Corp. v. Foseco Int'l Ltd.*, 910 F.2d 804, 814 (Fed.Cir.1990) ("A remand ... in a case thought to be completed, is a step not lightly taken....") Indeed, this court need only remand when it has "no way ... to affirm or reverse the district court's action under review." *Id.* Because, as noted above, the record supplies sufficient evidence to affirm the district court's action, this court does not venture to apply rule 52 strictly. See *id.* ("An appellate court need not close its eyes to the record where ... there is a way clearly open to affirm the district court's action."); see also, *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1370 (Fed.Cir.2004).

This court also perceives no fatal error in the trial court's refusal to estop Sundstrand from reversing its prior position that the APS 3200 surge control system and its particular use of IGV position was unique (and perhaps unforeseeable). "Judicial

estoppel applies when a party takes a later position that is inconsistent with a former position in the same dispute, on which the party had been successful and had prevailed based on the former position." *Bonzel v. Pfizer, Inc.*, 439 F.3d 1358, 1362 (Fed.Cir.2006). In the first place, it is not apparent that Sundstrand prevailed on any issue because of its alleged inconsistent position. Sundstrand did avoid a finding of literal infringement of claim 4 of the '194 patent and avoided enhanced damages despite the jury's determination of willful infringement. These putative victories, however, are difficult to link to Sundstrand's characterization of its product as unique. Indeed, the district court found that substantial evidence would have permitted a reasonable jury to conclude that the APS 3200 did not literally infringe elements 4(c) and 4(d) of the ' 194 patent because the APS 3200 did not literally infringe the flow-related parameter and did not use the IGV position in the same manner as described in those sections. *Honeywell I*, 166 F.Supp.2d at 1018-19. Moreover, the district court declined to enhance damages because "there was little direct evidence which evinced the sort of culpable mindset that would make enhanced damages appropriate." *Id.* at 1040. Because the record does not link Sundstrand's success on these issues to its argument that its surge control system was unique, judicial estoppel does not apply. If any party was estopped, it was Honeywell, which, as noted above, apparently established infringement using a broader definition of the equivalent than it now urges with respect to the foreseeability issue.

In sum, this court does not discern any error in the district court's judgment that Honeywell did not rebut the presumption of prosecution history estoppel with evidence of unforeseeability.

B. Tangential Relation

The tangential relation criterion for overcoming the Festo presumption is very narrow. *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 480 F.3d 1335, 1342 (Fed.Cir.2007). As this court provided in its *Festo IX* opinion on remand from the Supreme Court, the tangential relation criterion focuses on the "patentee's objectively apparent reason for the narrowing amendment."344 F.3d at 1369. To rebut the estoppel presumption with tangentiality, a patentee must "demonstrate that the rationale underlying the amendment bore no more than a tangential relation to the equivalent in question," or, in other words, that "the narrowing amendment was peripheral, or not directly relevant, to the alleged equivalent." *Id.* (citation omitted). Additionally, the reason for the narrowing amendment "should be discernible from the prosecution history record...."*Id.* If the prosecution history reveals no reason for the narrowing amendment, the presumption is not rebutted. See *id.* at 1371-72 (the patentee did not rebut because the prosecution history revealed no reason for the amendment). Silence does not overcome the presumption.

The record shows that the examiner simply instructed that the dependent claims would be allowed if rewritten into independent form. Those instructions, however, must be placed in their proper

context. As this court explained in Festo IX, "whether an amendment was merely tangential to an alleged equivalent necessarily requires focus on the context in which the amendment was made...."344 F.3d at 1370. The original independent claims disclosed a surge control system with P and delta P sensors and proportional and integral controls. Those claims, however, were rejected as obvious in light of the prior art. The original dependent claims were then rewritten into independent form and incorporated the limitations of the rejected independent claims. Therefore, the key to this inquiry is the content of the original dependent claims.[1] Those claims included the IGV limitation,

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1 Claims 17, 35, and 51 of the application that issued as the '893 provided:

> 17. The accessory power unit of Claim 16 wherein said compressor has adjustable inlet guide vanes, the value of said flow-related parameter is substantially independent of the temperature of the compressed air, said comparator means have an adjustable control set point representing said desired value of said parameter, and said accessory power unit further comprises means for transmitting to said comparator a reset signal for varying said set point as a function of the position of said inlet guide vanes in accordance with a predetermined reset schedule.
> 35. The control system of Claim 32 wherein the compressor has adjustable inlet guide vanes, and said control system further comprises a guide vane position sensor and a function generator coupled in series between the inlet guide vanes and said input portion of said comparator.
> 51. The method of Claim 49 wherein the compressor has adjustable inlet guide vanes, and said method further comprises the step of adjusting the relationship between

(Continued...)

which "refers to both the claimed structure of the [IGVs] and their claimed function in the surge control system...."*Honeywell II*, 370 F.3d at 1137 n. 2. Accordingly, when Honeywell rewrote the application dependent claims into independent form, it "effectively add[ed] the [IGV] limitation to the claimed invention." *Id.* at 1144. Thus, the record shows that Honeywell made the amendment to add the IGV limitation. Because the alleged equivalent focuses on the IGV limitation, the amendment bore a direct, not merely tangential, relation to the equivalent. Tangentiality does not help Honeywell overcome the presumption of surrender.

Because the record does not rebut the prosecution history estoppel presumption, Honeywell's challenges to the district court's rulings with respect to whether damages should be limited and whether the evidence is sufficient to support the jury's infringement verdict are moot.

IV

For the reasons stated herein, the court holds that Honeywell has failed to rebut the presumption of surrender, and is therefore barred by prosecution history estoppel from asserting the doctrine of equivalents. This court affirms the judgment of the district court.

AFFIRMED

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the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes.

COSTS

Each party shall bear its own costs.

NEWMAN, Circuit Judge dissenting.

The court today applies its new presumption of surrender to all equivalents of the claim elements and limitations that originated in dependent claims that were never amended and that were not the subject of prosecution history estoppel. The court held in its previous opinion, *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131 (Fed.Cir.2004) that "the surrendered subject matter is defined by the cancellation of independent claims that do not include a particular limitation and the rewriting into independent form of dependent claims that do include that limitation."*Id.* at 1144. Thus, although the limitation at issue (the inlet guide vanes used to control surge) had not been the subject of amendment, argument, or any other form of restriction, the court held that all equivalent guide vanes were presumed surrendered, not simply equivalents presumptively barred by prosecution history estoppel. *Id.* My colleagues held that since there was no narrowing amendment or limiting argument during prosecution of the Honeywell dependent claims, surrender of the entire universe of potential equivalents is presumed when the original independent claim is cancelled. I have previously pointed out the flaws in these generalizations, *id.* at 1146 (Newman, J., dissenting in part), for neither precedent nor logic requires the presumption of unlimited surrender when the prosecution history does not support unlimited surrender. See *Festo*

Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002):

> The complete bar [ ] is inconsistent with the purpose of applying the estoppel in the first place-to hold the inventor to the representations made during the application process and to the inferences that may reasonably be drawn from the amendment. By amending the application, the inventor is deemed to concede that the patent does not extend as far as the original claim. It does not follow, however, that the amended claim becomes so perfect in its description that no one could devise an equivalent. After amendment, as before, language remains an imperfect fit for invention. The narrowing amendment may demonstrate what the claim is not; but it may still fail to capture precisely what the claim is. *Id.* at 737-38, 122 S.Ct. 1831.

This court, after creating its new presumption of surrender, did not apply it to the Honeywell-Sundstrand issues on appeal, instead remanding to the district court. Indeed, the district court remarked on the absence of guidance, stating that it was "entering uncharted waters" in which it must "knock the rust off the old sextant and hope for the best." *Honeywell Int'l Inc. v. Hamilton Sunstrand Corp.*, No. 99-309, 2006 WL 2346446, at *6 n. 3 (D.Del. Aug.14, 2006). Now my colleagues, apparently

unsatisfied with the district court's analysis, offer their own, presenting a new rationale whereby they find that Honeywell engineers were indeed capable of solving the Sundstrand "double solution" problem using inlet guide vanes, although Honeywell did not do so, and therefore that the Sundstrand equivalent was "foreseeable" to Honeywell and should have been patented by Honeywell in 1983. On this theory, my colleagues hold that this equivalent (as the jury found) cannot be reached under the doctrine of equivalents. The flawed sweep of this new rule is illustrated as my colleagues apply the rebuttal criteria of "foreseeability" and "tangentialness" to a presumptive surrender with no outer limit, for there is no prosecution history that narrowed the claim element at issue.

My colleagues not only broaden the grounds of presumptive estoppel to estop all equivalents to any of the elements and limitations that were presented in the dependent claims, but they also restrict the grounds of rebuttal by holding that "foreseeability" is established by other than the "readily known equivalents" contemplated by the Court in *Festo*, 535 U.S. at 740, 122 S.Ct. 1831. Applying this new rule with no limit to the technology to which "foreseeability" is applied, my colleagues find "foreseeable" the Sundstrand guide vane technology that was developed a decade later. My colleagues find that Honeywell engineers were smart enough to have invented [2] the Sundstrand technology a decade

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2 The Sundstrand technology is patented to Sundstrand.

earlier, and thus that Honeywell should or could somehow have claimed it, although it was not described and enabled by Honeywell. On this reasoning, the court holds that Honeywell cannot rebut the presumption of surrender of all equivalents using inlet guide vanes. From this unsound analysis, I respectfully dissent.

Whether and when an inventor is entitled to reach beyond the literal scope of what is claimed in the patent has received continuing attention from courts and the technology community, for the issues of law are not easy, and the considerations of equity are in tension. The Court in *Festo,* and earlier in *Warner-Jenkinson, Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997), revised the legal and equitable balance, limiting the doctrine of equivalents while preserving its viability. This court's new presumption of surrender of all equivalents, when there is no prosecution history estoppel as to elements from dependent claims that are placed in independent form, places new constraints on the patentee's access to the doctrine of equivalents. This aspect of patent-based innovation requires a more balanced analysis, in the national interest in innovation. As the Court stated in *Festo*, "if the doctrine is to be discarded, it is Congress and not the Court that should do so." 535 U.S. at 733, 122 S.Ct. 1831.

Rebuttal of the presumption of surrender-foreseeability

Now, although I accept as the law of this case that a presumption of surrender arose with respect to the use of inlet guide vanes to control surge, my

colleagues apply the *Festo* rebuttal criteria in significantly more restrictive ways than were established by the Supreme Court. The Court had explained that "[t]hough prosecution history estoppel can bar a patentee from challenging a wide range of alleged equivalents made or distributed by competitors, its reach requires an examination of the subject matter surrendered by the narrowing amendment." *Id.* at 737, 122 S.Ct. 1831. However, my colleagues do not examine the surrendered subject matter, and indeed they can not, for there is no narrowing amendment to define surrendered subject matter. The dependent claims were not rejected on any ground; they were simply "objected to" because they were in dependent form. The use of the inlet guide vanes was never discussed in the prosecution, and the guide vane clause was not amended in any dependent or independent claim. There was no prosecution for this issue based on prior art.[3] Unlike the Court's *Festo* presumption of prosecution history estoppel, which is limited by narrowing amendment, the panel majority's presumption of surrender is without limit. *Honeywell*, 370 F.3d at 1144 ("Under such circumstances, the surrendered subject matter is defined by the cancellation of independent claims

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3 Sundstrand stated to the district court that "during the prosecution of the Patents-in-Suit, the Examiner did not reference any Prior Art that disclosed inlet guide vanes or the use of their position as part of a surge control system." Appellee's Br. at 10.

that do not include a particular limitation and the rewriting into independent form of dependent claims that do include that limitation. Equivalents are presumptively not available with respect to that added limitation.").

In the remand decision from which this appeal is taken, the district court had recognized that the element for which equivalency was charged-the inlet guide vanes used to adjust a set point to avoid surge-had not been narrowed and thus did not fit the Festo mold. Nonetheless, the district court ruled that the Sundstrand apparatus and method with respect to the inlet guide vanes were "foreseeable" and that the rationale underlying the amendment bore more than a "merely tangential" relation to the Sundstrand equivalent. However, the district court declined to give its reasoning, stating that the record was "too extensive and complex" for the court to identify the facts on which its conclusion rested, and that it would be "unduly burdensome" to explain which evidence it credited. *Honeywell*, 2006 WL 2346446 at *6 n. 2. The district court stated that "it seems quite intuitive to this lay court that measuring IGV position ... is a reasonably obvious way-both at present and in 1982-83-to determine whether the APU is experiencing high flow or low flow." *Id.* at *6. The court also mentioned "credibility," although it did not identify who or what it did not believe. The court concluded that the Sundstrand use of inlet guide vanes to control surge was "foreseeable," although witnesses for both sides agreed that the use of inlet guide vanes for surge control was not known at the time of the Honeywell invention.

Equivalency is determined as of the time of litigation, while foreseeability for equivalency purposes is determined at the time of the patent application. The Court in *Festo* explained that foreseeability means "readily known equivalents," 535 U.S. at 740, 122 S.Ct. 1831, not unknown equivalents developed a decade later. Honeywell's use of inlet guide vanes was developed before 1982, and the Sundstrand inlet guide vanes were developed between 1990 and 1995. Sundstrand had argued at the jury trial that its guide vane system does not infringe, either literally or under the doctrine of equivalents, because it was designed to meet what Sundstrand calls the "double solution" problem, and that its system makes a different use of inlet guide vane position than does Honeywell. These differences were not disputed. My colleagues nonetheless find the Sundstrand device and method "foreseeable" based on a combination of prior art surge control devices, and hold that Honeywell could have described and claimed the Sundstrand technology a decade before it was developed by Sundstrand.

In deciding whether the presumption of surrender has been rebutted, the question is whether the technological equivalent is embraced by subject matter that was relinquished during prosecution of the patent. This requires analysis of the prosecution history leading to cancellation of the original independent claim and rewriting of the original dependent claim in independent form. Patent claims are customarily presented in independent and dependent form, a practice encouraged by the Patent and Trademark Office, for it simplifies examination.

When an original independent claim is cancelled, it is obligatory that the next dependent claim be placed in independent form. Even on the majority's analysis of the rebuttal criteria of foreseeability and tangentialness, the proper approach is to determine for equivalency was implicated in that cancellation.

On remand, the district court attempted to apply the instructions from the Supreme Court and this court as to rebuttal of the presumption of prosecution history estoppel. The Court has guided that the foreseeability analysis must be "directed to the particular equivalent in question," *Id.* at 740, 122 S.Ct. 1831. The particular equivalent is the Sundstrand device and method using the inlet guide vane positions to solve the so-called "double solution" problem that attends Sundstrand's choice of the DELPQP flow-related parameter, by blocking the control signal during high-flow conditions. Honeywell states that this is an equivalent use of inlet guide vanes, in the context of Honeywell's use of inlet guide vane position to adjust the set point against which the flow-related parameter is measured across the spectrum of flow conditions. The panel majority finds the Sundstrand device and method foreseeable and thus not reachable under the doctrine of equivalents.

The panel majority cites two references that it designates as prior art that rendered the Sundstrand device foreseeable a decade before Sundstrand developed it. My colleagues focus first on a device called the L1011 developed in the late 1970s; this device made no use of inlet guide vanes, but instead used a totally different system that approached the problem of the ambiguity of a flow parameter at high

flow conditions by use of a "shock switch." I suppose the purpose of this reference is to show that the problem was not new; however, recognition of the problem does not render foreseeable Sundstrand's equivalent that was developed more than a decade later using inlet guide vanes.

The panel majority also relies on the Glennon patent, and finds that in 1979 it was known that adjusting guide vane position has an impact on airflow. However, the issue is not the use of louvered vanes to control airflow, a known concept; the issue is whether it was foreseeable, at the time of the Honeywell patent application, to use inlet guide vanes for surge control in an accessory power unit in the manner of the Sundstrand device, as part of the decision logic for high-flow conditions when the DELPQP parameter produces an ambiguous signal.

My colleagues suggest that testimony from Honeywell's witnesses Clark and Muller establish foreseeability of the Sundstrand equivalent, for they testified that Honeywell was working on the use of inlet guide vanes to improve the operation of a surge controller, and that if they knew about the Sundstrand problem they might have figured out how to solve it in the way that Sundstrand solved it a decade later. But these witnesses did not testify that Honeywell already had this knowledge, or that it was known to the prior art or otherwise was a known equivalent or "reasonably foreseeable." It was undisputed that the Sundstrand equivalent was developed a decade later in full view of the Honeywell patents.

My colleagues also state that the district court's findings are predicated on witness credibility, and thus are untouchable. The district court did not tell us what aspects strained its credulity, or indeed why the district court had sustained the jury verdict in 2001 if tainted by the incredibility of witnesses. Deference to a district court's findings on credibility is generally warranted, but when the issue is one of objective science/technology, more is required than a terse announcement by the court that no reasons will be given for its ruling. As explained in *Anderson v. Bessemer City*, 470 U.S. 564, 105 S.Ct. 1504, 84 L.Ed.2d 518 (1985), deference is warranted only when competing witnesses have "told a coherent and facially plausible story that is not contradicted by extrinsic evidence," and when the finding is "not internally inconsistent." *Id.* No deference is owed to a district court's conclusion predicated upon findings it did not state or explain. See *Edwards v. Wyatt*, 335 F.3d 261, 274-75 (3d Cir.2003).

The district court's reluctance to state the facts on which its conclusion rests, as Federal Rule of Civil Procedure 52 requires, negates the traditional deference. I accept that the record in this lengthy litigation is difficult to summarize, but I also accept-for it is uncontradicted-that the record is devoid of any evidence that the Sundstrand equivalent previously existed or was the "readily known equivalent" required by *Festo*. It was uncontradicted that the Sundstrand equivalent was developed years after the Honeywell application was filed and prosecuted, and only after considerable effort. Nothing in the record supports my colleagues' finding that the Sundstrand equivalent was

foreseeable at the time the Honeywell patent applications were prosecuted.

Simply presenting claims of varying scope, whether in independent or dependent form, is not a narrowing amendment or argument. The patent examining rules encourage, through lowered fees, the use of dependent claims, for it facilitates examination. It is routine for broader claims to be cancelled and dependent claims to be rewritten in independent form. This protocol has no relevance to whether a claimed element is amended or narrowed or argued during prosecution. It is the narrowing of scope during prosecution that produces the presumptive estoppel; claim elements and limitations that were not the subject of amendment or argument do not raise the *Festo* presumption, and should not be deemed to raise this court's new presumption. Cancelling an independent claim is not an estoppel-generating act as to elements whose scope was not amended or otherwise restricted during prosecution.

Equivalency is determined element by element, *Warner-Jenkinson*, 520 U.S. at 29, 117 S.Ct. 1040, yet on the panel majority's presumption of surrender, there is no restricting action by which to measure what was surrendered. In Festo the Court was explicit that the burden is to "show[ ] that the amendment does not surrender the particular equivalent in question." 535 U.S. at 740, 122 S.Ct. 1831. My colleagues err in now holding that all equivalents of an element presented by dependent claim are presumed surrendered by simply cancelling the independent claim.

Tangential Relation

The Court explained that when the asserted equivalent related to "aspects of the invention that have only a peripheral relation to the reason the amendment was submitted," the presumption of estoppel would be rebutted. *Id.* at 738, 122 S.Ct. 1831. Precedent illustrates that the "tangential" criterion is rebutted when "[t]here is no indication in the prosecution history of any relationship between the narrowing amendment and [the process] which is the alleged equivalent in this case." *Insituform Tech., Inc. v. CAT* Contracting, Inc., 385 F.3d 1360, 1370 (Fed.Cir.2004). That analysis well fits this case, for there is no indication in the prosecution history of any relationship between Honeywell's cancellation of the independent claim and the alleged equivalent Sundstrand apparatus or method.

The panel majority states that "when Honeywell rewrote the application dependent claims into independent form, it 'effectively add[ed] the [IGV] limitation to the claimed invention'," maj. op. at 1315 [alteration in original], and therefore, it provided "a direct, not merely tangential, relation to the equivalent," *id.* at 1316. This is not the tangential relationship contemplated by *Festo*, where the Court demanded review of the reason for the narrowing amendment and the relation of that reason to the accused equivalent. It does not suffice to say that by narrowing a claim by adding an element, *ipso facto* the relation to the accused equivalent element is not tangential. This criterion relates to why an amendment was made; it does not become irrebuttable simply when the accused

equivalent concerns the same element that was added by amendment.

Exploration of this criterion requires, at a minimum, review of the reason for cancellation of the independent claim and rewriting the dependent claim in independent form. The panel majority makes no mention of the prosecution of the original independent claims, except to state that the examiner rejected them on the ground of obviousness. Although the panel majority states that "the key to this inquiry is the content of the original dependent claims," this obscure statement leads to no analysis. In a situation where an originally dependent claim is asserted against an infringer under the doctrine of equivalents, and the asserted limitation was first introduced in a dependent claim, then according to the panel majority there is always more than a tangential relationship between the reason for the amendment and the accused equivalent, even when there is no finding as to the reason for the amendment. This renders the presumption of estoppel irrebuttable, whatever the reason for the amendment. However, the question is whether the subject matter of the accused equivalent was relinquished by the patentee during prosecution. This question should be resolved on its facts, not converted into a complete bar.

Why does it matter?

These nine years of proceedings do not reflect an optimum mode of patent dispute resolution. The jury verdict of infringement under the doctrine of equivalents was rendered in February 2001, and all outstanding issues were resolved by the district court

by opinion rendered in 2001. The jury was instructed in accordance with precedent:

> Instruction No. 3.5.3.... The test for determining equivalency is whether, at the time of the asserted infringement, one of ordinary skill in the art would consider the differences between the accused product or method and the element or elements of the patent claim not literally present to be insubstantial. If such a person would consider those differences not to be substantial, then infringement exists under the doctrine of equivalents.

Honeywell must prove infringement under the doctrine of equivalents by a preponderance of the evidence. In determining whether Honeywell has proven that a feature of the Hamilton Sundstrand product is equivalent to an element of a patent claim, you should focus on the individual element and maintain a special vigilance against allowing the concept of equivalence to eliminate that element entirely.

It is not a requirement under the doctrine of equivalents infringement that those of ordinary skill in the art knew of the equivalent when the patent application was filed or when the patent issued. The question of whether Hamilton Sundstrand's product is equivalent to that defined in Honeywell's claims is to be determined as of the time of the alleged infringement.

The correctness of the instruction was not in dispute. The verdict of no literal infringement, but of infringement under the doctrine of equivalents, was sustained by the district court. *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 166 F. Supp.2d 1008 (D.Del.2001). The court's holding today takes another step to remove patent issues from the jury, but adds nothing to consistency or stability or predictability of the law. I respectfully dissent.

UNITED STATES DISTRICT COURT,
D. DELAWARE

C.A No. 99-309 (GMS)
August 14, 2006

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant.

Josy W. Ingersoll, Melanie K. Sharp, Young, Conaway, Stargatt & Taylor, Wilmington, DE, for Plaintiffs.

Gretchen A. Bender, Morris, James, Hitchens & Williams, Richard D. Kirk, The Bayard Firm, Wilmington, DE, for Defendant.

MEMORANDUM

GREGORY M. SLEET, District Judge.

INTRODUCTION

In the above-captioned action plaintiffs Honeywell International, Inc. and Honeywell Intellectual Properties, Inc. (collectively, "Honeywell") accuse defendant Hamilton Sunstrand Corp. ("HSC" or "Sunstrand") of infringing U.S. Patent No. 4,380,893 (filed Feb. 19, 1981) ("the '893 patent") and U.S. Patent No. 4,428,194 (filed Sept. 27, 1982) ("the '194 patent"). After a ten-day trial in early 2001, a jury found infringement of both patents under the doctrine of equivalents, and awarded Honeywell more than $46.5 million in damages. HSC subsequently appealed. On June 2, 2004, an *en banc* panel of the Federal Circuit remanded the case back to this court for further proceedings. In accordance with the remand instructions, the court held a two-day bench trial on March 23-24, 2006 to determine whether prosecution history estoppel bars Honeywell form asserting the doctrine of equivalents. For the following reasons, the court holds that Honeywell is so barred by prosecution history estoppel.

BACKGROUND

A. Honeywell's Patented Technology

The '893 Patent and the '194 Patent have a common specification. The only difference between the two patents is that the '894 Patent claims an apparatus embodying the invention, whereas the '194 Patent claims a method embodying the

invention. The Federal Circuit's *en banc* opinion provides a succinct description of the invention claimed by both patents:

> The Honeywell patents are directed to an aircraft auxiliary power unit ("APU"), a small gas turbine engine usually located in the tail section of an airplane. The APU generates electricity and incorporates a load compressor to provide compressed air needed both to start the aircraft's main engines and to control the environment of the aircraft's cabin during flight. During flight, the amount of compressed air required for these purposes fluctuates substantially. A valve is used to control the amount of air exiting the compressor through the main air duct, which supplies compressed air to the aircraft's systems. Rapid changes in the demand for compressed air needed can produce "surge," a flow instability that occurs when pressure builds up in the main air duct. In a surge condition, the air attempting to exit the compressor's main air duct is unable to do so. Instead the airflow reverses direction, surging back into the compressor and potentially damaging the APU. The APU must therefore be designed in such a way as to control surge. Prior systems controlled surge by drawing in more air than was needed and venting (bleeding) the excess through a surge bleed valve

> in order to reduce pressure in the main air duct. Such systems maintained sufficient output airflow, effectively controlling surge, but were inefficient in operation and wasteful of energy.

The Honeywell APU is designed to be more efficient by avoiding excess air bleeding in its control of surge. To do this it is necessary to determine when and how far to open the surge bleed valve in order to maintain a level of flow sufficient to avoid surge. To reach this end, Honeywell's invention establishes a "set point" that represents the minimum flow at which surge can safely be avoided. In the claimed invention, "ambient air ... is drawn through a set of adjustable inlet guide vanes." '893 patent, col. 3, ll.64-65. The value of the set point is selected "as a function of the position of said inlet guide vanes." *Id.*, col. 12, ll.11-12; see also '194 patent, col. 12, ll.15-16. The set point is compared to a "flow-related parameter" that represents airflow out of the compressor as determined by a sensor. '893 patent, col. 2, ll.47-48; '194 patent, col. 2, ll.48-49. Thus a comparison is made between the actual flow conditions (represented by the flow-related parameter) and the desired flow conditions (represented by the set point). If the system determines that airflow out of the main air duct is too low, the surge bleed valve will be opened to prevent the build up of excess pressure leading to surge.

Honeywell Int'l v. Hamilton Sundstrand Corp., 370 F.3d 1131, 1134 (Fed.Cir.2004).

B. HSC's Accused Product

The accused product in this case is an APU manufactured by HSC known as the APS 3200. It also "uses an active surge control system that compares a flow-related parameter to a set point and adjusts the surge bleed valve in response." *Id.* at 1136. However, "Sundstrand's device establishes a set point that is dependent upon ambient air temperature, rather than a measurement of inlet guide vane position. This set point is compared to a flow-related parameter called DELPQP." *Id.* "The DELPQP value used in the accused device has an unusual characteristic. In most airflow conditions the value of DELPQP is directly proportional to the amount of airflow. At high levels of flow, however, DELPQP becomes inversely proportional to the amount of flow, i.e., above a certain level of flow [i.e., the speed of sound] DELPQP decreases instead of increases as flow increases. Reliance upon DELPQP under these conditions might incorrectly characterize a safe high flow situation as an unsafe low flow situation, resulting in the surge bleed valve being opened to increase flow unnecessarily, causing excess APU fuel consumption." *Id.* at 1136 n. 1. "Because of characteristics unique to DELPQP, the APS 3200 blocks control signals used to operate the surge bleed valve during extreme high flow conditions. This prevents unnecessary bleeding of air during such conditions. The determination of whether to block these control signals is based in part on the position of the APS 3200's inlet guide vanes." *Id.* at 1136. More specifically, if the inlet guide vanes (or "IGVs") are open wide, the APS 3200 is operating in a safe

high flow situation and bleeding is unnecessary. However, if the IGVs are barely open, the APS 3200 could be operating in an unsafe low flow situation and bleeding may become necessary.

C. The Claims at Issue

Only three independent claims are at issue on remand: claims 8 and 19 of the ' 893 patent and claim 4 of the '194 patent. All three of those claims are reproduced below, with the controversial IGV limitations emphasized in italics:

> 8. A gas turbine engine accessory power unit having a fluctuating compressed air supply demand, said accessory power unit comprising:
> (a) a compressor having adjustable inlet guide vanes;
> (b) duct means for receiving compressed air discharged from said compressor and supplying the received air to the pneumatically-powered apparatus;
> (c) surge bleed means operable to exhaust from said duct means a selectively variable quantity of air to assure at least a predetermined minimum flow rate through said duct means and thereby prevent surge of said compressor;
> (d) sensing means for sensing the value of a predetermined, flow-related parameter within said duct means and generating an output signal indicative of said value, said value of said flow-related parameter being substantially independent of the temperature of the compressed air;
> (e) comparator means for receiving said sensing

means output signal and generating an error signal representing the difference between the sensed value of said parameter and a desired value thereof, said comparator means having an adjustable control set point representing said desired value of said parameter;

(f) means for transmitting to said comparator means a reset signal for varying said set point as a function of the position of said inlet guide vanes in accordance with a predetermined reset schedule; and

(g) control means for receiving said error signal and transmitting to said surge bleed means a control signal to operate said surge bleed means, the magnitude of said control signal having, relative to the magnitude of said error signal, a proportional component and an integral component,

whereby said minimum flow rate through said duct means is essentially constant regardless of the compressed air supply demand of the pneumatically-powered apparatus.

'893 patent, col. 11, l.52 thru col. 12, l.23 (emphasis added).

19. A control system for assuring a substantially constant minimum flow rate through a duct receiving air discharged from a compressor or the like having adjustable inlet guide vanes, the duct having a supply outlet connected to pneumatically-operated apparatus having a variable supply air demand, the duct further having an exhaust outlet, said control system comprising:

(a) a flow regulating device adapted to be positioned in the exhaust outlet and operable to

selectively vary air flow outwardly therethrough;
(b) a sensing device having a sensing portion adapted to be positioned in the duct to sense therein a predetermined parameter related to the air flow rate through the duct, said sensing device further having an output portion;
(c) an adjustable set point comparator having an input portion coupled to said output portion of said sensing device, and an outlet adapted to generate an error signal;
(d) a proportional controller having an inlet coupled to said output of said comparator and further having an outlet;
(e) an integral controller having an inlet coupled to said outlet of said comparator and further having an outlet;
(f) a summer having a first inlet coupled to said outlet of said proportional controller, a second inlet coupled to said outlet of said integral controller, and an outlet coupled to said flow regulating device; and
(g) a guide vane position sensor and a function generator coupled in series between the inlet guide vanes and said input portion of said comparator.
Id., col. 14, l.62 thru col. 16, l.22 (emphasis added).

4. A method of utilizing a compressor of a gas turbine engine to power pneumatically-operated apparatus having a variable inlet air flow demand, the compressor having adjustable inlet guide vanes, said method comprising the steps of:
(a) interconnecting a supply duct between the compressor and the pneumatically-operated apparatus;

(b) flowing discharge air from the compressor through said supply duct to the pneumatically-operated apparatus;

(a) maintaining an essentially constant minimum supply duct flow rate, despite fluctuations in the flow rate of air received by the pneumatically-operated apparatus, by exhausting air from said supply duct in response to variations therein of the value of a predetermined, flow-related parameter, the flow rate of air exhausted from said supply duct being related to the magnitude of said parameter value variations in both a proportional and time-integral manner, said maintaining step including the steps of providing an outlet passage from said supply duct, positioning in said outlet passage a surge bleed valve operable to selectively vary the flow of air outwardly through said outlet passage, generating an integral control signal in response to said variation in said flow-related parameter, generating a proportional control signal in response to said variations in said flow-related parameter, and simultaneously utilizing said integral and proportional control signals to operate said surge bleed valve; and

(d) adjusting the relationship between the magnitudes of said integral and proportional control signals and the magnitudes of said parameter variations as a function of the position of the inlet guide vanes.

'194 patent, col. 10, l.64 thru col. 12, l.16 (emphasis added).

D. Prosecution History

Setting this case apart from many of the other patent cases that come before this court is the relatively straightforward nature of the relevant prosecution history:

> [A]ll of the asserted claims were originally dependent on other claims in Honeywell's patent applications (application claims 16 and 32 of the '893 patent and application claims 48 and 49 of the '194 patent) that did not contain the inlet guide vane limitation. These claims were rejected as obvious in light of the prior art during the prosecution of Honeywell's patents. Application claims 17 and 35 of the '893 patent and application claim 51 of the '194 patent, which further included the inlet guide vane limitation, were not allowed only because they were dependent on the rejected independent application claims. The examiner indicated that application claims 17, 35 and 51 would be allowable if rewritten into independent form. In response, the rejected independent claims were cancelled and application claims 17, 35 and 51 were amended to expressly incorporate the limitations of the rejected independent claims. The amended application claims issued respectively as claims 8 and 19 of the

> '893 patent and claim 4 of the '194 patent....*Honeywell,* 370 F.3d at 1137.

As HSC correctly points out, rather than traversing the examiner's objection, Honeywell merely accepted the examiner's invitation to rewrite the dependant claims as allowable independent claims.

E. Procedural History

Prior to the first trial in this case, HSC moved for summary judgment on the issue of doctrine of equivalents, arguing that the amendments during prosecution (i.e., rewriting dependant claims as independent claims) amounted to a narrowing amendment under *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,* 234 F.3d 558 (Fed.Cir.2000) *(en banc) ("Festo I"),* and therefore barred Honeywell from asserting the doctrine of equivalents with regard to the IGV limitations. That motion was denied and the issue was submitted to the jury for its consideration. Although the jury found no literal infringement, it did find that the APS 3200 infringed the patents under the doctrine of equivalents. On appeal, the Federal Circuit held that Honeywell's amendments did in fact narrow the claims, and thus raised a rebuttable presumption that Honeywell surrendered the doctrine of equivalents with regard to the IGV limitations. *Honeywell,* 370 F.3d at 1144. This court's instructions on remand are to determine whether Honeywell can overcome that presumption. *Id.* If Honeywell is unable to do so, then "the jury verdict cannot stand." *Id.*

DISCUSSION

The first step the court must take in executing its instructions on remand is to precisely articulate the equivalent element in question. Honeywell argues that the equivalent element is "the Sunstrand APS 3200 surge control system with its unique DELPQP flow-related parameter and its particular use of inlet guide vane position as part of the high-flow logic that that parameter occasioned." (D.I. 416 ¶ 66.) In other words, Honeywell contends that the equivalent element in the accused product is the use of (1) a static pressure differential (i.e., DELPQP), which can be indicative of surge only if the APU is experiencing low flow, in combination with (2) IGV position, which is indicative of whether the APU is experiencing low flow or high flow, to detect surge. Although HSC disagrees with Honeywell on this point, it is sufficient for present purposes to assume *arguendo* that Honeywell's articulation is correct as a matter of law.

In order to successfully rebut the presumption of surrender, [1]"the patentee must demonstrate that

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[1] In a memorandum dated January 8, 2001, the court held that "Honeywell did not surrender the elements at issue during the prosecution of the patents at issue" and that "Honeywell did not give up an embodiment of the invention with the inlet guide vane." *Honeywell International, Inc. v. Hamilton Sunstrand Corp.*, No. 99-309, 2001 U.S. Dist. LEXIS 2155, at *19-*20 (D.Del. Jan. 8, 2001). Honeywell argues on remand that "[t]hose factual findings were left undisturbed by the Federal Circuit's legal rulings." (D.I. 416 ¶ 131.) That argument is not convincing for two reasons. First, the court's

(Continued...)

the alleged equivalent would have been unforeseeable at the time of the narrowing amendment, that the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent in question, or that there was 'some other reason' suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 344 F.3d 1359, 1369 (Fed.Cir.2003) (en banc) ("Festo III"). Each of these three rebuttal criteria are addressed below.

A. Unforeseeability

Of the three criterion, unforeseeability is perhaps the easiest to apply because it is a familiar concept in the law. In Festo III, the Federal Circuit gave the following guidance:

> This criterion presents an objective inquiry, asking whether the alleged equivalent would have been unforeseeable to one of ordinary skill in

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holdings were *legal* conclusions, not *factual* conclusions. *Honeywell,* 2001 U.S. Dist. LEXIS 2155, at * 14 ("Whether prosecution history bars an assertion of infringement under the doctrine of equivalents is a matter of law for the court to decide."). Second, those legal conclusions are the very conclusions overruled by the Federal Circuit's *en banc* decision. *Honeywell,* 370 F.3d at 1144 ("Honeywell is presumptively estopped from recapturing equivalents to the inlet guide vane limitation.").

> the art at the time of the amendment. Usually, if the alleged equivalent represents later-developed technology (e.g., transistors in relation to vacuum tubes, or Velcro (R) in relation to fasteners) or technology that was not known in the relevant art, then it would not have been foreseeable. In contrast, old technology, while not always foreseeable, would more likely have been foreseeable. Indeed, if the alleged equivalent were known in the prior art in the field of the invention, it certainly should have been foreseeable at the time of the amendment. By its very nature, objective unforeseeability depends on underlying factual issues relating to, for example, the state of the art and the understanding of a hypothetical person of ordinary skill in the art at the time of the amendment. Therefore, in determining whether an alleged equivalent would have been unforeseeable, a district court may hear expert testimony and consider other extrinsic evidence relating to the relevant factual inquiries. 344 F.3d at 1369 (internal citation omitted).

Honeywell argues that in the 1982-83 timeframe, which the parties agree is the relevant period to consider, the use of DELPQP and IGV position to detect surge was unforeseeable. HSC disagrees, and points to an APU developed in the

early 1970s called the L1011. [2]The L1011, like the APS 3200, measures a static pressure differential which can be indicative of surge only if the APU is experiencing low flow. (D.I. 417 ¶ ¶ 237-40.) However, instead of distinguishing between high flow and low flow through IGV position, the L1011 utilizes what is known as a "shock" switch. When the air flow reaches the speed of sound, a shock wave activates the shock switch and indicates to the surge control system that the APU is experiencing high flow. In spite of this difference, HSC demonstrated at trial that the use of IGV position to distinguish between high flow and low flow was in fact foreseeable to one skilled in the art in 1982-83. (Id.¶ ¶ 246-54 .) Indeed, it seems quite intuitive to this lay court that measuring IGV position (i.e., are the inlet guide vanes open a lot or a little?) is a reasonably obvious way--both at present and in 1982-83--to determine whether the APU is experiencing

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[2] In support of their respective positions both sides adduced sufficient evidence at trial from which one could reasonably conclude that either party's position is correct. The court, therefore, is forced to resolve disputed issues of material fact. While a fair reading the trial transcript might give the impression that resolution of those disputed facts is a close call, the court, after observing witness demeanor and assessing witness credibility first hand, does not believe such resolution is a particularly close call after all. However, due to the volume of evidence this case has produced over the course of the last seven years, it would be unduly burdensome to explain the rationale for accepting or rejecting every exhibit or line of testimony in the record. It is sufficient, in this court's view, to merely demonstrate that all factual conclusions are supported by substantial evidence.

high flow or low flow. Therefore, Honeywell has failed to rebut the presumption of surrender through the unforeseeability criterion.

B. Tangential Relation

Unlike that of the unforeseeability criterion, the relatively recent vintage of the tangentialrelation criterion places the court in waters that have yet to be fully charted. [3]Fortunately, a brief survey of the Federal Circuit's case law provides the court with sufficient guidance in this case to confidently

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[3] Indeed, such charting will be necessary given the potential dangers lurking beneath the surface. For example, if the overarching *Festo* question is whether the patentee can show that "one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent," *Festo III*, 344 F.3d at 1365, then the rationale underlying the amendment (i.e., whether or not it is tangentially related to the alleged equivalent) does not seem particularly probative of the answer. In other words, the tangential-relation criterion directly addresses the question of whether the patentee *would* have drafted a claim to literally encompass the alleged equivalent, but it does not necessarily address the question of whether the patentee *could* have so drafted the claim. *Cf. Honeywell Int'l, Inc. v. Hamilton Sunstrand Corp.*, No. 99-309, 2006 U.S. Dist. LEXIS 11829, at *15 (D.Del. Mar. 22, 2006) (regarding the "some other reason" criterion, explaining that "the court will only consider testimony from [a patent attorney] as to why he *could not* (as opposed to *would not)* have drafted the claims to encompass the equivalent") (emphasis in original). With the passage of time, further developments in the case law will hopefully provide GPS-like guidance to courts navigating these waters. In the meantime, however, it will probably be necessary to simply knock the rust off the old sextant and hope for the best.

conclude that the reason for Honeywell's amendment bears more than a tangential relationship to HSC's equivalent. Beginning with *Pioneer Magnetics, Inc. v. Micro Linear Corp.*, which was decided after the Supreme Court's decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 (2002) *("Festo II")*, but before the Federal Circuit's *en banc* decision in *Festo III*, the baseline principle was established that an amendment is "not tangential to the equivalent in question" where "the amendment was made to avoid the very prior art that contained the equivalent." 330 F.3d 1352, 1357 (Fed.Cir.2003). "It does not follow, however, that equivalents not within the prior art must be tangential to the amendment." *Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1383 (Fed.Cir.2005). Rather, the focus of the tangential-relation criterion is "the patentee's objectively apparent reason for the narrowing amendment." Festo III, 344 F.3d at 1369. The presumption of surrender arises if the "amendments were made to distinguish prior art patents based, *at least in part*, on the [narrowed limitation] of the invention." *Id.* at 1373 (emphasis added). *See also Talbert Fuel Sys. Patents Co. v. Unocal Corp.*, 347 F.3d 1355, 1360 (Fed.Cir.2003) (explaining that the amendment could not "be deemed 'tangential' to the ... alleged equivalent" where the narrowed limitations of the invention "were at issue during prosecution, and were the direct, not tangential, reason for the narrowing amendments to [the] claim limitations"); *Terlep v. Brinkmann Corp.*, 418 F.3d 1379, 1385-86 (Fed.Cir.2005) (same); *Bus. Objects, S.A. v. Microstrategy, Inc.*, 393 F.3d 1366, 1374 (Fed.Cir.2005) (same). Moreover, if "[t]he prosecution history reveal[s] no reason for the amendment, [the

patentee cannot] show that the rationale underlying the amendment was only tangential to the accused ... equivalent." [4]*Biagro W. Sales, Inc. v. Regents of the Univ. Of Cal.*, 423 F.3d 1296, 1306 (Fed.Cir.2005). Thus, unless it is "clear" that the rationale underlying the amendment is only peripheral to the alleged equivalent, the tangential-relation criterion is impotent to rebut the presumption of surrender. *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, No. 05-1157, 2006 U.S.App. LEXIS 19799, at *62 (Fed.Cir.2006).

Although this places a heavy burden on the patentee, it is not an impossible burden to carry. For example, in *Insituform Techs., Inc. v. Cat Contracting, Inc.*, the patent at issue related to a method of impregnating a flexible tube with resin through the "application of [a] vacuum through a window in the wall of the tube by means of a cup applied to the window, as well as repositioning the cup [as the resin progresses toward the vacuum]". 385 F.3d 1360, 1369 (Fed.Cir.2004). Originally, however, the application claim at issue did not include reference to the repositionable cup. *Id.* at 1368-69. It was only during prosecution that the patentee amended the claim to include reference to

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[4] The court notes that rebuttal via the tangential-relation criterion is not unavailable merely because the reason for the amendment was not explicitly stated by the patentee in the prosecution history. Rather, rebuttal via the tangential-relation criterion is unavailable if there is no "objectively apparent reason for the narrowing amendment," *Festo III*, 344 F.3d at 1369.

the repositionable cup in order to avoid prior art having a vacuum source only at the far end of the tube, and therefore requiring a much larger suction compressor than the patented invention. *Id.* at 1369. Similar to (but not identical to) the patented invention, the accused device applied multiple vacuum sources to the tube by means of multiple repositionable cups. *Id.* at 1363. Under those facts, the Federal Circuit concluded that "the reason for the narrowing amendment was peripheral, or not directly relevant, to the alleged equivalent" because the patentee "made it clear that the difference between its process and [the prior art] was that its process did not have the disadvantage ... of a large compressor at the end of the [tube]." *Id.* at 1370 (quoting *Festo III,* 344 F.3d at 1365). Moreover, there was "no indication in the prosecution history of any relationship between the narrowing amendment and a multiple cup process." *Insituform,* 385 F.3d at 1370. Thus, the court held that the presumption of surrender was successfully rebutted. *Id.*

The patentee also carried its burden in *Primos, Inc. v. Hunter's Specialties, Inc.,* where the technology at issue was a "Game Call Apparatus" used by hunters to lure their prey. 451 F.3d 841, 843 (Fed.Cir.2006). The two relevant limitations of the claim at issue were (1) a plate extending over (2) a membrane. *Id* . at 844. During prosecution, the claim was narrowed to include only plates that are "differentially spaced" above the membrane. *Id.* at 849. The accused device did not have a plate at all, but rather it had a dome extending over the membrane. *Id.* at 844. The patentee contended that the dome of the accused device was equivalent to the

plate described in the patent, whereas the alleged infringer argued that the narrowing amendment barred a finding of infringement under the doctrine of equivalents. *Id.* at 848-49. The Federal Circuit, noting that "the territory surrendered by the 'differentially spaced' amendment comprises plates that are not differentially spaced above the membrane," held that the differentially-spaced dome of the accused device was only tangentially related to the rationale underlying the amendment. *Id* . at 849. Thus, as it had done in *Insituform,* the Federal Circuit held that the presumption of surrender was successfully rebutted. *Id.*

As stated above, the court assumes *arguendo* that Honeywell is correct that the equivalent element is properly characterized as "the Sunstrand APS 3200 surge control system with its unique DELPQP flow-related parameter and its particular use of inlet guide vane position as part of the high-flow logic that that parameter occasioned." (D.I. 416 ¶ 66.) With that articulation of the equivalent in mind, Honeywell argues that "[t]he objectively apparent reason for the amendments at issue was to include additional limitations from the original dependent claims in order to overcome prior art that had nothing to do with inlet guide vanes but rather disclosed a surge control system with P and Delta P sensors and proportional and integral control." (Id.¶ 216.) Although the prior art cited by the examiner does not contain the precise equivalent at issue, Honeywell glosses over the fact that DELPQP is a parameter also calculated by measuring P and Delta P. (See *id.* ¶ 54.) Thus, both the prior art avoided by the amendments and the equivalent in question

involve the same (or very similar) pressure measurements, and therefore, it is not "clear" that the amendments had no more than a tangential relationship with the equivalent.

Honeywell's attempts to analogize this case to *Insituform* and *Primos* are unconvincing. In *Insituform,* the amendment was clearly designed to distinguish the prior art based on the location of the vacuum source through the use of repositionable cups, and therefore the number of cups used by the alleged equivalent was merely tangential to the rationale underlying the amendment. Likewise in *Primos,* the amendment was clearly designed to distinguish the prior art based on the differential spacing between the membrane and the plate, and therefore the shape of the plate was merely tangential to the rationale underlying the amendment. Here, by contrast, the amendments were clearly designed, *at least in part,* to distinguish the measurement of P and Delta P found in the prior art, and therefore the use of that measurement by the equivalent (as articulated by Honeywell) is directly related to the rationale underlying the amendments. The court thus holds that Honeywell has failed to rebut the presumption of surrender through tangential-relation criterion.

C. Some Other Reason

In light of this court's holding in *Honeywell Int'l, Inc. v. Hamilton Sunstrand Corp.,* No. 99-309, 2006 U.S. Dist. LEXIS 11829, at *15 (D.Del. Mar. 22, 2006), Honeywell has elected to concede this method of rebuttal pending appeal.

CONCLUSION

For the reasons explained above, the court holds that Honeywell has failed to rebut the presumption of surrender, and therefore, it is barred by prosecution history estoppel from asserting the doctrine of equivalents. Accordingly, the jury's finding of infringement must be overturned and judgment must be entered in HSC's favor.

ORDER

IT IS HEREBY ORDERED THAT:

1. The verdict and judgment (D.I.264, 265) be VACATED; and
2. Judgment be ENTERED in favor of the defendant.

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

2006-1602

HONEYWELL INTERNATIONAL INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC.,

Plaintiffs-Appellants,

v.

HAMILTON SUNDSTRAND CORPORATION,

Defendant- Appellee.

Appeal from the United States District Court for the District of Delaware in case no. 99-CV-309, Judge Gregory M. Sleet.

ORDER

ENTERED MAY 29, 2008

A petition for rehearing en banc having been filed by the Appellants, and the matter having first been referred as a petition for rehearing to the panel that heard the appeal, and thereafter the petition for rehearing en banc having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the petition for rehearing en banc be, and the same hereby is, DENIED.

The mandate of the court will issue on June 5, 2008.

For the Court
s/
JAN HORBALY
Clerk